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THE
Ophthalmic Review

A RECORD OF OPHTHALMIC SCIENCE.

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SPINDLE-SHAPED ENLARGEMENT OF THE BLIND
SPOT ASSOCIATED WITH CONGESTION OF
THE OPTIC DISC.

BY

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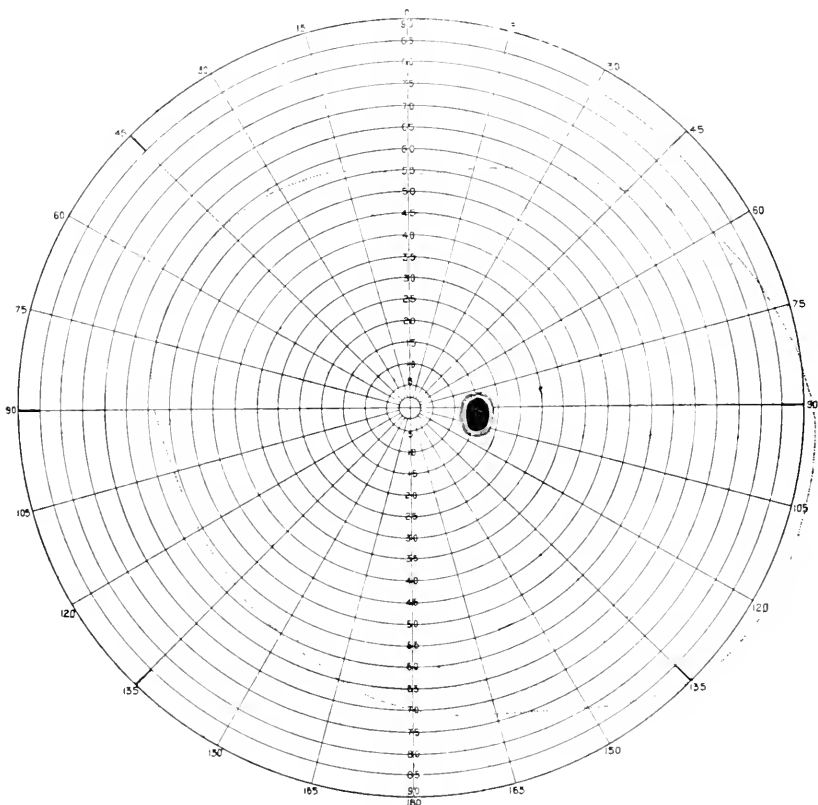
THE attention of the authors of this paper was directed to Bjerrum's screen by Dr. Arthur Sinclair, who, in a highly-suggestive communication recently made to the Ophthalmological Society, has already demonstrated its value in recording alterations in the field of vision in cases of glaucoma. The observations here described deal with certain changes in the shape of the blind spot which were first noticed during the determination of the visual field of a patient suffering from well-marked sympathetic irritation. The spot assumed a spindle shape, which in this case disappeared after the enucleation of the exciter.

Normally, the blind spot of Mariotte is an oblong space with rounded corners, lying a little to the right or to the left of the fixation point. The rounding of the angles varies in different individuals, and the vertical length has to the horizontal breadth the proportion of six to four. About one-third of the whole space is above a horizontal line drawn through the fixation point. (Fig. 1.) A narrow zone of relative or transitional amblyopia for white surrounds the area of absolute blindness, and outside this is the limit of the absolute scotoma for blue, then that

2 Enlargement of the Blind Spot

for yellow, then that for red, and last of all that for green, the order being the same as that which obtains at the

Fig. 1.



Normal blind spot with the zone of transitional amblyopia around it.

peripheral part of the visual field, and there seeming to be a zone of transitional amblyopia for all the colours. The absolute blind area for green is relatively very large,

and its inner boundary almost reaches the point of central fixation. In the five cases now recorded the enlargement was altogether vertical, and there was no change in the horizontal width.

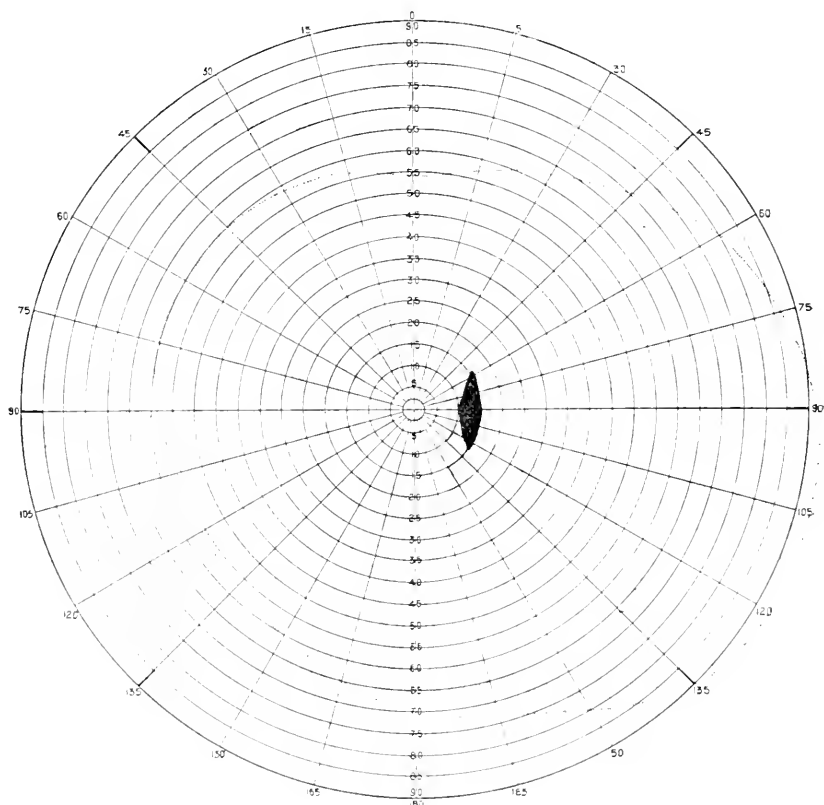
The first case in which the alteration was noticed was that of a patient, W.G., 56 years of age, who came to the Ophthalmic Institution suffering from a perforated wound in the left eyeball, in which a piece of metal was lodged. The man's story was that the sight of the injured ball had been completely destroyed, five months before, by a chip of metal. He complained that the globe which had been hurt was painful, and that the vision of the sound eye was impaired. The left ball, on the cornea of which there was a large tri-radiate scar, had a prolapsed iris, was shrunken and tender to the touch, and showed marked ciliary injection. The tension was —3. The vision of the right eye was barely $\frac{6}{6}$, but when aided by +.75 spherical lens it became $\frac{6}{5}$: the pupil was circular and reacted normally; there was no redness; and tension was normal. On ophthalmoscopic examination it was found that the media were clear, but that there was marked congestion of the optic disc, and that the retinal vessels were decidedly tortuous and engorged. A Bjerrum's screen chart revealed that the blind spot was elongated and spindle-shaped, the length vertically being to the breadth horizontally as 12 to 4. (See fig. 2.) Two days later the injured ball was enucleated, and by the end of a fortnight after the operation all complaint as to the remaining eye had ceased; vision was $\frac{6}{5}$, the congestion of the optic disc was very much less, the vessels had become less tortuous, and the blind spot normal.

The second case was that of a man, E. T., 37 years of

Enlargement of the Blind Spot

age, whose cornea had been injured by a piece of wire. The wound had been infected, and panophthalmitis set in so severely, and progressed so rapidly, that, in order

Fig. 2, Case I.



to save the patient the intense suffering always associated with suppurative inflammation of the globe, it was determined, four days after the accident, to enucleate the

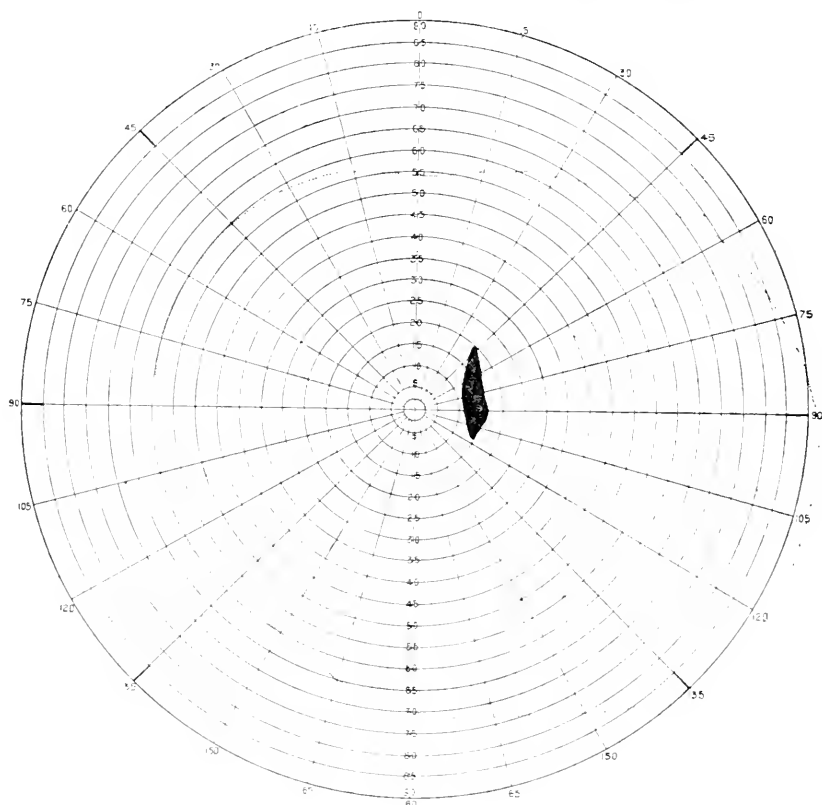
eyeball. A week after the operation the man began to complain of impairment of sight of the remaining eye, but examination disclosed nothing abnormal in either vision or fundus; there was no central absolute scotoma, and no central colour scotoma for red or green; and though some physical symptoms seemed to point to excess in the use of alcohol or tobacco or both, careful investigation dispelled all suspicion of this being the case. Every time he came to the Institution, however, the patient continued to complain that his sight was impaired, and that everything appeared "unsteady" and "wavy"; but, as nothing could be discovered amiss it almost seemed as if he were malingering. Two months after the injury, vision was slightly below normal, and it was just possible that there was a trace of congestion of the optic disc; but that was all, and the blind spot was still normal. At the end of the third month, however, there was no doubt that the man was seriously ill. His skin was clammy, his breath foul, and his fingers and tongue tremulous, while he complained bitterly of loss of sleep and appetite. Externally, the eye showed nothing abnormal, but vision was reduced to $\frac{6}{10}$, and with the aid of a $-7\frac{1}{2}$ spherical lens was a little below normal; the optic disc was fiery red; and the retinal vessels were tortuous and engorged. The blind spot was by this time elongated (rather more upwards than downwards) into a spindle with the vertical length bearing to the horizontal breadth the proportion of 12 to 4. (See fig. 3.) A week later still the vision was reduced to $\frac{6}{15}$, and there was so great photophobia that no trustworthy observations could be made on Bjerrum's screen.

The patient was admitted into the Institution and

6 Enlargement of the Blind Spot

energetically treated with mercurial inunction, pilocarpine injections, and diuretics; while the right temple was leeches repeatedly, and atropine instilled into the eye.

Fig. 3, Case II.



Fourteen days after admission his vision was, under the influence of atropine, $\frac{6}{60}$, and though the optic disc was still very red, the blind spot had by this time become

again normal. His general condition was very much improved.

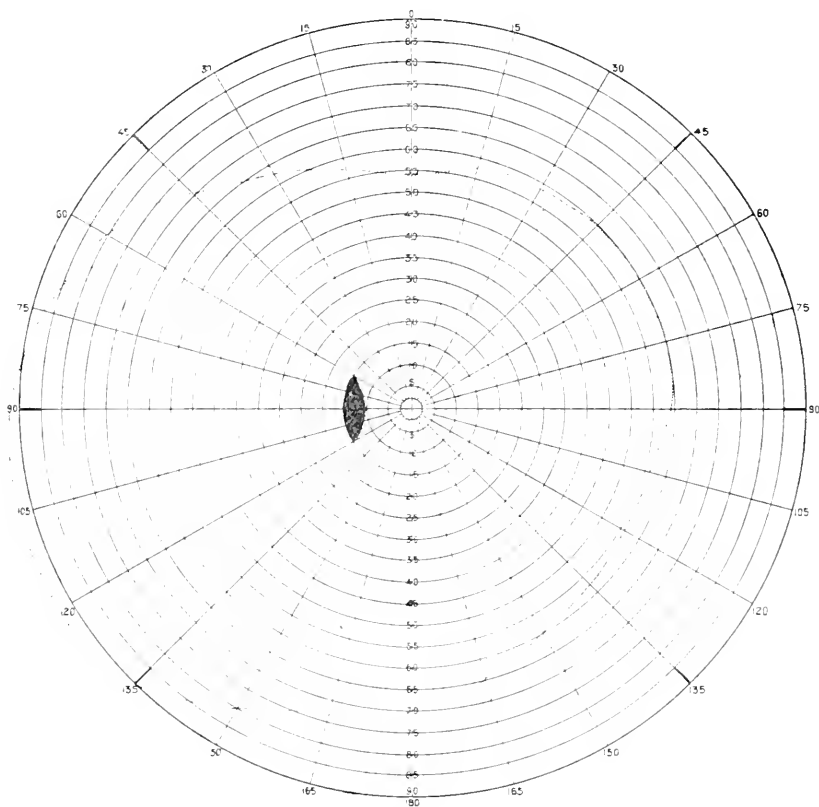
The third case was that of a young woman, A. M., 20 years of age, whose right eye had been shrunken since childhood, and who had, several months before she came under our observation, noticed that the sight of her left eye had begun to fail. Examination of the shrunken eye showed that the cornea was clear except for a transverse calcareous film, that the anterior chamber was very deep, and that the pupil (the size of a pinhole) was filled with calcareous material, and that there was a slight tenderness to pressure. The vision of the left eye was $\frac{6}{15}$, but when aided by a -5 spherical lens it became nearly $\frac{6}{10}$; the optic disc was very red; the vessels were tortuous; and the blind spot was elongated into a spindle of which the vertical length had to the horizontal breadth the proportion of 10 to 4. (See fig. 4.) Two days after the girl's admission to the Institution the shrunken globe was enucleated, and 48 hours later the patient declared that the sensation of impaired sight in the left eye was gone. The blind spot was then found to have resumed its normal shape and size, and the vision, under the influence of atropine, was $\frac{6}{18}$, but aided by a $+1D.$ spherical lens it improved to $\frac{6}{9}$.

The fourth case was that of a boy, E. M., $10\frac{1}{2}$ years of age, who three weeks before he came to the Ophthalmic Institution, had injured his right eye with a pair of scissors which caused a perforated wound of the cornea. There was traumatic cataract, with intense ciliary injection, and great pain on pressure. Examination of the left eye showed that the vision was $\frac{6}{20}$, which, with the aid of a $-5D.$ spherical lens was raised to nearly $\frac{6}{15}$;

Enlargement of the Blind Spot

the pupil was circular and reacted well to light; there was a good deal of photophobia; the optic disc, which was of a deep pink colour all over, had an unusual number

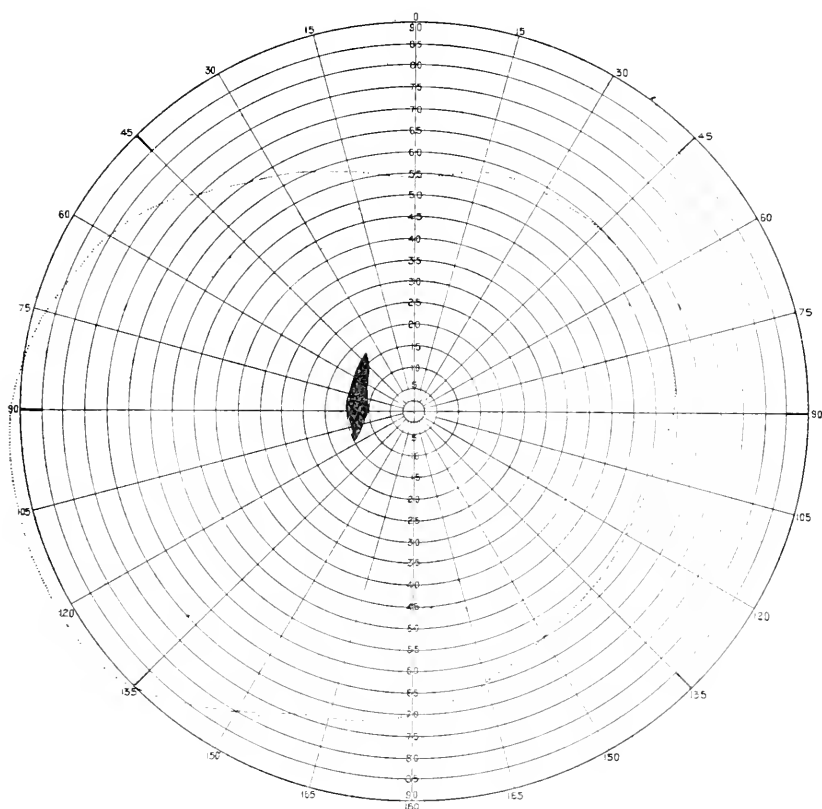
Fig. 4, Case III.



of small vessels on the surface; the larger blood-vessels were engorged; and the blind spot was spindle-shaped, the length being to the breadth in the proportion of 12

to 4. Two days later the injured globe was enucleated, and forty-eight hours after the operation it was found that, though the condition of the fundus was unchanged,

Fig. 5, Case IV.



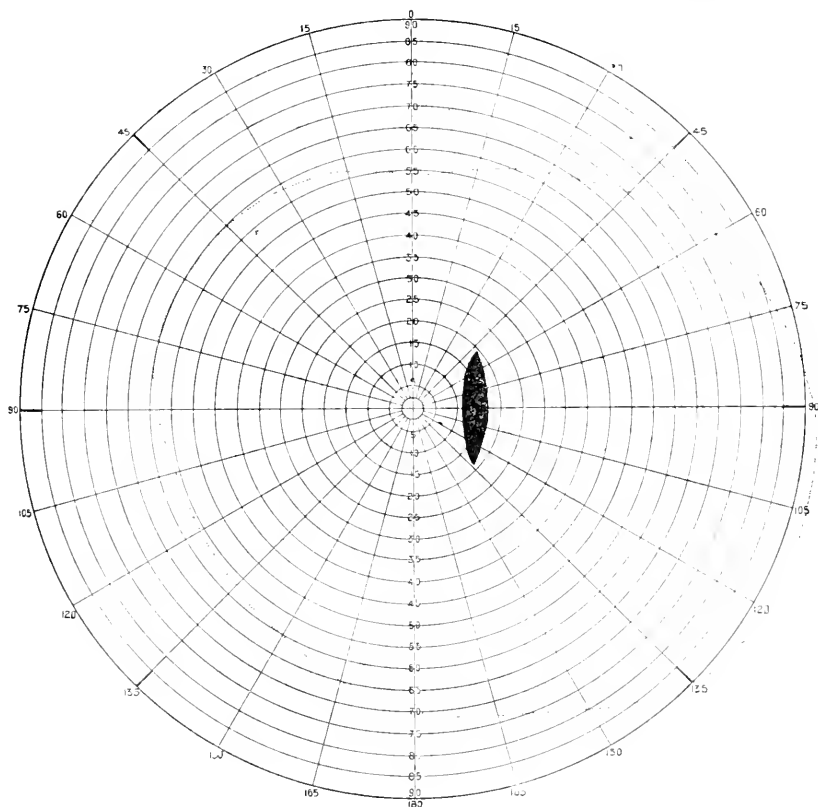
vision had become nearly $\frac{6}{12}$, no assistance now being obtained from the use of a concave lens), and the blind spot had resumed its normal size and shape.

The fifth case was that of a man, J. D., aged 29, who, in May, 1905, received a penetrating wound of the left eye. When, seven months afterwards, he came to the Ophthalmic Institution for treatment, he complained that the sight of the right eye had been failing for six weeks. Except for light perception the sight of the left eye was entirely gone; there was a large coloboma of the iris, and extensive iridodialysis; and the lens was cataractous and partially absorbed. Examination of the right showed that vision was barely one-third of the normal, but aided by a $-7.5D$. spherical lens it rose to nearly one-half; there was distinct congestion of the right optic disc; and the blind spot, when mapped out by Bjerrum's screen, was found to be elongated in the same way as in the other cases recorded, but with a proportion of 18 to 4. (See fig. 6.) The patient was advised to have the left eyeball enucleated, but refused to have anything done meanwhile, his reason being that he was engaged in legal proceedings in connection with the settlement of a claim for damages made under the Workmen's Compensation Act.

Of these patients the first, third, fourth, and fifth undoubtedly suffered from sympathetic irritation. In the second case, although it is probable that the inflammation in the right eye resulted from the injury to the left, there were some exceptional features. It is usually stated that sympathetic ophthalmia comes on from three to six weeks after the injury, but here it made its appearance a week after enucleation, and enucleation took place four days after the accident. Another peculiar point also is that it made its appearance notwithstanding the panophthalmitis. Possibly, however, had there been no enucleation there would have been no sympathetic trouble, for the

operation may have opened up a passage for the micro-organisms or their toxins from the infected orbit to the sound eye.

Fig. 6, Case V.



From a consideration of these five cases it seems highly probable that under certain circumstances the spindle-shaped enlargement of the blind spot may furnish an important and valuable danger signal of the approach of

sympathetic inflammation. To determine by ophthalmoscopic examination alone when there is no healthy fundus for comparison, whether the optic disc be, or be not, congested is often a matter of great difficulty; and this was exactly the problem that presented itself in the cases we have described. In another, which is now to be mentioned, there seems to be confirmation from the negative side. A girl, nine years of age, was recently under treatment in the Ophthalmic Institution for a perforated wound in the right ciliary region; and, although no complaint was made as to the sight of the other eye, ophthalmoscopic examination revealed redness of the optic disc which competent observers declared to be pathological. The exciter was certainly in such a state as to cause considerable anxiety, for it was congested, tender to the touch, and soft, and as if it were about to shrink; but, as Bjerrum's screen gave a normal blind spot, it was determined to postpone enucleation and to keep the patient under careful observation. The result was in every way satisfactory: the injured eye steadily improved, the inflammation and the tenderness to touch disappeared, and the tension became normal.

It seems, therefore, highly probable, if not almost certain, that the spindle-like enlargement of the blind spot denotes active congestion of the optic disc, the shape being determined by increased size and turgescence in the superior and inferior branches of the retinal artery and vein. [Since the above was printed, Dr. Arthur Sinclair's paper on "Bjerrum's method of testing the field of vision" has been published in the "Transactions of the Ophthalmological Society" for 1905. In this paper, Dr. Sinclair mentions that "irregular extensions of the

amblyopic area usually occur at the upper and the lower margins and correspond generally to the position of the large blood-vessels as they leave the disc."'] If, then, in a case of infected wound, or of degenerative changes, in one eye, its fellow began to give trouble, no matter how slight, and careful examination showed a congested disc with the characteristic enlargement of the blind spot, the sign would, in our opinion, go far to determine the question of the immediate enucleation of the exciter.

The presence of a low degree of transitory myopia (which was found in four of the cases described, and which disappeared when the injured eye was removed) seems to afford confirmation of the diagnosis of impending sympathetic inflammation. It occurred in two cases that came under our notice before our Bjerrum's screen investigations were begun. In one—that of an intelligent boy of 14 years of age—there had been a perforating injury to one eyeball, and though enucleation was advised, the mother refused consent till there were clear signs of mischief to the other eye. The vision was $\frac{6}{10}$, and became normal only with the aid of a $-7\frac{1}{2}$ D. spherical lens, atropine brought about no change, the optic disc was very red, and the vessels were engorged and tortuous. When the damaged globe was enucleated the myopia speedily passed away and the vision, even under the influence of atropine, became $\frac{6}{5}$. In the other case, one of infected traumatic ulcer, the patient, who had previously been in no way short-sighted, required the aid of a -5 D. spherical lens to raise the vision to normal. He refused to have enucleation performed until an iris bombé had formed in the sympathiser. The operation

was then too late, the irido-cyclitis went on and filled the pupil with a thick plastic exudate, the tension became greatly increased, and vision was reduced to a bare light perception. This temporary myopia was, in some of our cases, probably due to spasm; but, in the one where it persisted under atropine, it can be explained only by supposing that the congestive changes brought about an altered state of the media whereby the refractive index was increased.

INFLUENCE OF FRYNIN ON THE EYE.

PRELIMINARY COMMUNICATION.

By V. POPOW, Persia, Turbat-i-Kydari.

THE word "frynin" was first used by Fornara¹ in his paper "Sur les effets physiologiques du venin du crapaud" for the denomination of the alcoholic extract from the cutaneous and so-called parotid glands of toads. In the year 1888 Staderini² published in *Annali di Ottalmologia*, the work "Effetti locali del veleno del rospo nell' occhio umano," and in 1904 Professor Kravkow³ wrote in *Russkiy Vrach* on the venomous secretion of the cutaneous glands of the toad.

For my experiments I obtained the frynin by Kravkow's method³ and used a 1 per cent. aqueous solution to which I added the sublimate by Valentine's⁴ method.

At the first instillation of 3 or 4 drops of the above-mentioned solution into the conjunctival sac there was evidently some irritation, blepharospasm, free lachrymation and photophobia, and the vessels of the conjunctiva were engorged; subsequently there was œdema and slow loss of the sensibility of the conjunctiva and cornea. The changes

of the epithelium of the cornea from frynin resembled the changes from cocain,^{5, 6} although in a much less degree. Diffusion in the anterior chamber, explored by Professor Bellarminow's⁷ coloured method, increased almost doubly. There was a little myosis, but refraction, accommodation, acuteness, and the field of vision were almost unchanged. Intraocular tension was examined with Maklakow's⁸ tonometer. In the first hour after instillation of frynin tension was not augmented.

The solution was invariably boiled before use.

I have performed under the influence of frynin two iridectomies for optical purposes, one discission of cataract, some openings of the punctum lacrymale, etc.

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2. *Ibid.*
3. *Ibid.*
4. *Westnik Ophthalmologii*, 1904, p. 253.
5. Swanzy. *Handbook of the Diseases of the Eye*, 7th edition.
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REVIEWS.

WALTER SCHULZE (Berlin). **Inoculation of Rabbits' Eyes with Syphilis.** *Klinische Monatsblätter für Augenheilkunde*, September, 1905.

So long as it was accepted as an axiom that the lower animals did not suffer from syphilis, investigations into the etiology of that disease were necessarily confined within narrow limits. Of recent years, however, it has been shown that animals may, by inoculation with syphilitic material, acquire a disease which, if not syphilis, at any rate bears much resemblance to it. The

16 Inoculation of Rabbits' Eyes with Syphilis

disease so produced in the anthropoid apes bears a closer similarity to syphilis than that produced in any other animal, but even in horses and pigs a roseolar, and sometimes a maculopapular, eruption is produced. The objection that such eruptions may be merely the result of the introduction into the circulation of one animal of the serum of a diverse species has been met by showing that from the first inoculated animal another of the same species may be inoculated and the same disease reproduced.

John Siegel, during the present year, drew attention to a form of micro-organism which he first discovered in cases of small-pox, and subsequently in foot-and-mouth disease and in scarlet fever. Finally, he has recognised organisms of the same form in hard chancres, condylomata, and the blood of persons with recent syphilitic eruptions, and by inoculating rabbits and guinea-pigs with syphilitic material he produced a severe illness, occasionally presenting symptoms like those of secondary syphilis, in the course of which the same micro-organisms were found in large numbers in the blood and internal organs. These organisms appear to form a hitherto unrecognised group of protozoa allied to the flagellata. They are very small, ovate bodies, of which the greatest diameter varies from $\frac{1}{2}$ m. to $2\frac{1}{2}$ m. When living no nucleus is visible, but when stained characteristic paired nuclei, 2, 4, 8 or even 16 in number, are distinctly seen. They possess marked motility, and careful observation shows the presence of a flagellum, sometimes reaching 10m. in length, attached to one end of the body.

It has not hitherto been found possible to distinguish by any differences in their conformation the organisms of the four diseases named; but in small-pox and scarlet fever the organisms are found in the protoplasm of the epithelial cells, in foot-and-mouth disease in the nucleus of the epithelial cells, and in syphilis in the protoplasm of the connective-tissue cells and the ground-substance and juices of the connective-tissue. The name *Cytorrhcytes variola* was first applied by Guarnieri to these bodies as he found them in small-pox, and the generic term may conveniently be used for the whole group.

Schultze has studied the local results of the inoculation of syphilitic material in the eyes of animals. He used for the purpose fresh tissue from a non-ulcerated hard chancre blood from a syphilitic patient who had recently developed a roseolar rash, and fresh kidney-juice from rabbits previously inoculated

with syphilis. He also employed in some cases chancre and condyloma tissue preserved in a mixture of equal parts of glycerine and water. Except that material preserved in this manner for over three weeks remained inert, the results of the inoculation in all these cases were essentially the same. The method of inoculation was to open the anterior chamber, scratch the iris with the point of the knife and apply the material to the scratches with a spatula. The course of events after inoculation was as follows:—The slight reaction from the wound subsided in about two days; on the third day redness began again, the cornea became slightly cloudy all over, the aqueous hazy, the iris became injected and muddy, and a few days later showed little thickenings at the seat of inoculation. All these appearances increased up to the 10th or 11th day, without, however, reaching the degree of causing definite hypopyon or any adhesions of the iris. After the 14th day the process became more localised at the seat of inoculation, and as the general injection of the globe subsided the little swellings in this situation became more defined, and gradually turned from pink to a greyish tint. Their greatest size was reached in three to four weeks. After this they in their turn gradually diminished, but so slowly that in many cases they could still be traced after three or four months.

The general condition of the animals varied considerably. During the first week they began to show signs of dulness and malaise, and a certain number died within the first two weeks. Of those that survived some showed ulcers on the skin, rhagades on the lips, marked falling out of the hair; but all these symptoms were much less marked than in monkeys.

The microscopical characters corresponded with the clinical aspect of the disease, that is, they were not those of an acute inflammation but rather of a chronic process. This process evidently attacks above all the blood-vessels. First the intima of the arteries becomes imperfect, and mononuclear leucocytes pass through their walls. Then the connective-tissue begins to swell, and in about three weeks the iris has reached its greatest thickness. The small arteries have by now a broad hyaline sheath of oedema around them, and somewhat later this extends also to the larger vessels. By special staining cytorrhyses can be demonstrated in the tissues, chiefly in the neighbourhood of the vessels, and particularly in the intima and in the vessel

sheath. The binuclear form was that most commonly found. Healthy control animals showed no such organisms in the tissues.

It was notable that the number of cytorrhcytes in the tissues about the seat of inoculation was small compared with the number visible in a smear preparation of the kidney-juice of the same animal taken about the 14th day; the iris forms merely a favourable point of entrance for the organisms, general infection rapidly occurs, and the local appearances become relatively insignificant.

Apes inoculated from the infected rabbits always developed both primary and secondary syphilitic lesions, and from their internal organs cytorrhcytes could be abundantly obtained.

The experiments of Siegel and of Schultze seem to have been carefully preserved from fallacy, and their results, if confirmed by other observers, obviously form an important advance in our knowledge of syphilis.

W. G. L.

A. SCHAPRINGER. **The Cause of Spasmus Nutans (Head-nodding).** *Centralblatt für praktische Augenheilkunde*, August, 1905.

MARY BUCHANAN (Philadelphia). **Two Cases of Spasmus Nutans.** *Annals of Ophthalmology*, xiv., 3 (1905).

THE observation, said to be first recorded by Caillé in 1890, that the head-nodding in these patients ceases when the eyes are covered suggests naturally that this peculiar spasmodic movement has its origin in an abnormal distribution of the impulses directing the eye movements. Raudnitz, in 1897, further demonstrated in a considerable number of cases that the patients had lived in dark houses, and suggested that since there often was some bright spot or area to which the child was in the habit frequently of directing the gaze, there might be found in this fact (taken along with rickets, which is usually present in the patients) a cause of the development of the symptom. With this Schapringer agrees so far, but when Raudnitz regards as the connecting link between the darkened surroundings and the head-nodding a condition of fatigue of the muscles, the author does not accept the suggestion; as one of his reasons for this he points to the frequent(?) occurrence

of unilateral nystagmus in association with spasmus nutans. This, he thinks, negatives the fatigue theory, and one must look elsewhere for the link. He proceeds first to ask what physiology teaches as to the behaviour of the retina when a bright spot is regarded for some time by an eye adapted for the dark, and goes on to quote from W. Nagel in answer:—"If the image of a feebly illuminated area falls upon the macula its brightness seems to diminish, while if it falls upon another portion of the fundus it seems, on the contrary, to increase; in the first case the image may in point of fact altogether vanish. Further, even in indirect sight the brightness seems to undergo variation when one observes it carefully. The fatigue of keeping it closely in view is greater in feeble illumination, and a light of low intensity when quietly regarded in indirect sight will fade considerably after a few seconds, but the slightest movement of the eye restores it immediately to its former intensity." Schapring's suggestion then is to this effect: Children of the class with which we are dealing are usually living in a dim light. That has been shown by John Thomson (as well as by others), who noticed that the months during which such cases are prevalent are the darkest of the year. The children are apt, as has also repeatedly been observed, to have some bright spot or object at which they continually look. If it is with the macula that the child fixes the object, it will soon fade and become dim; the child therefore endeavours to get the image upon a part of the fundus near to the fovea, but not the fovea itself, in fact to fix excentrically. But since a bright spot even here fades shortly, the child acquires the habit of changing the fixation area from time to time, of varying the actual spot on which the image falls,—a constantly variable excentric fixation. This movement, at first purposive, becomes habitual, and nystagmus is developed, as well as head-nodding. Bring the child into other conditions, into bright daylight, and this recently developed centre for movable excentric fixation loses its function, the child fixes with the fovea, and recovery ensues; recovery seems to be invariable when the surroundings are altered for the better.

To explain the occurrence of unilateral nystagmus, and that in the so-called "fixing" eye if there be a difference in the behaviour of the two, Schapring brings forward two considerations: first, that although in the adult the association

of movement between the two eyes is the closest possible, the connection is much less rigid in the infant, and therefore it is possible that the impulses to one eye of fixation or of movement are superior to those sent to the other, and this moving fixation will thus be impressed most emphatically, or only, upon the better eye; second, that suppression of the image of one eye is very ready in the child, as is shown by the early occurrence of it in strabismus, and therefore it is easy for the infant to select one eye and pay attention to the image formed upon it alone. It has been stated by some observers that when the head is held stationary, the nystagmus increases. As a possible explanation of this Schapring suggests that perhaps to the centre for "moving fixation" there are two sub-centres, one for the head (nodding), the other for the eyes (nystagmus), and that when one is prohibited from acting the other movement is vicariously increased. To judge from his paper he seems even himself to regard this as somewhat fanciful.

Buchanan believes that the head-nodding and the nystagmus are both attempts on the part of the child to obtain binocular vision, which is a view somewhat at variance with that of Schapring, and certainly does not accord well with his explanation of the origin of unilateral nystagmus. She goes on to advocate careful study of all the ocular conditions present, and advises that the state of refraction in particular should be attended to. In the first of her two cases it appeared as though the abnormal refraction might be one factor, at all events. This occurred in the person of a female infant of seven months, coloured, in whom there was myopia of 4D., with a normal fundus and a small amount of astigmatism. The child was apparently in other respects quite healthy, and when she was seen again at almost two years of age the only indications which could in any way be interpreted as pointing to rickets were some prominence of the forehead, and head-sweats at night. By that time the myopia had increased to 10D., with obliquity of the axes of the astigmatism, and though the nystagmus and head-nodding had ceased, convergent strabismus was present. It is right to add in this connection that the child's mother had a high degree of convergent strabismus, determined apparently by the presence of a large nebula of one cornea, the result of ophthalmia neonatorum. Buchanan's second case was that of a boy of six months, lowly myopic. She

seems to agree with Thomson in regarding head-nodding as a co-ordination neurosis,—depending upon the attempt of the child to acquire the complex co-ordinated movements by which even the binocular field is given a wide range of position by means of the muscles of neck and eye, and she thinks that one ought not to put aside unheeded the story (which one often hears) of the child having had a fall. When a child falls and strikes its head, a good deal of the shaking may locate itself about the iter, just the region in which lie the nuclei concerned with these co-ordinated movements thus being laboriously acquired as a regulated mechanism.

If the head-nodding, etc., is due to an error of refraction she considers that this error should be corrected, but adds somewhat regretfully that “no one in this country at least has the temerity to prescribe glasses for infants.”

W. G. S.

A. BIRCH-HIRSCHFELD and INOUE. **Experimental Investigations in Thyroid Amblyopia.** *Archiv für Ophthalmologie*, 61, 3.

FIVE cases of toxic amblyopia from thyroid feeding have been recorded by Coppez, and a case of optic neuritis attributed to the same cause by Aalbertsberg. In 1902 Edmonds demonstrated to the Pathological Society chromatolysis of the nerve cells of brain and spinal cord after thyroid feeding of two apes. Starting from these data, the authors of the above paper undertook an experimental investigation of the subject, and they are to be congratulated on the fact that their research is the first one in which a chronic toxic amblyopia has been successfully investigated by experimental methods.

The subjects of the experiments were four dogs, of different ages and breeds, which, after being weighed and ophthalmoscopically examined, were fed with Burroughs and Wellcome's thyroid tabloids, commencing with small doses gradually increased to 8 or 10 grammes per diem, the feeding being continuous during periods varying from $3\frac{1}{2}$ to 10 months. At first the effects were practically nil, with the exception of some attacks of diarrhœa, but ultimately, though in one case in which the treatment was continued for nearly ten months the

obvious effect continued *nil*, in the other three cases very definite results followed. Ophthalmoscopically, these were confined to a gradually increasing pallor of the optic discs without any alteration in the pupillary reaction. Neither optic neuritis, vascular changes (except the gradual atrophic shrinking of the arteries), nor retinal changes were noted. The pallor of the discs was not confined to the temporal halves, but was uniform. Only in one case had the sight of the animal obviously deteriorated. After the pallor of the discs had unmistakably commenced in either of the animals, one eye was excised under ether, and subjected to pathological examination, while the treatment was continued for many months, and the other eye examined at a later stage of the process. No direct relation was established between the amount of thyroid administered and the rapidity of the atrophic process. Evidently idiosyncrasy goes for much in thyroid poisoning just as it does in toxic amblyopia due to tobacco or alcohol.

The histological examination of the retinal and optic nerves gave the following results:—The earliest and chief injuries were sustained by the ganglion cells of the retina. The chromatin substance contained in these cells showed considerable disturbance, similar to that frequently described in the ganglion cells of cord and brain, due to poisoning. Vacuoles were frequent, and though in some animals, *e.g.*, the cat, this may be a normal condition, in the dog apparently it is not. The nucleus was generally in an excentric position, but retained its normal structure during the early stages of the process, when presumably the condition of the cell is recoverable, even though the changes in the chromatin may be far advanced. At a later stage the structure of the nucleus itself is destroyed. An important point is that the degenerative process attacks the cells very unequally. In some the process may be far advanced, while adjacent cells may appear normal. With regard to the nerve, in the three cases where the retina was affected degeneration of the nerve fibres was also present. This was most evident in sections taken immediately behind the disc, the evidence of degeneration diminishing as the sections were made higher up. The interstitial tissue showed no evidence of inflammation, so that the changes in the nerve appeared to be secondary to those in the retina. Moreover the changes were not confined to any particular section of the nerve.

Incidentally the authors remark that a relative central scotoma does not necessarily imply a lesion confined to the macula. The physiological dignity of the macular cells gives much greater importance to a disturbance in which a certain number of these are involved than to one in any other part of the retina, where a disturbance of a portion of the retinal cells may occur without obvious symptoms. This accords with an observation made by Harman at the 1904 meeting of the British Medical Association, that if appropriate tests are applied the functions of the peripheral parts of the retina are always found to be affected in cases of tobacco amblyopia, though when tested in the ordinary way the fields continue full.

A. H. T.

V. SICHERER (Munich). **Alypin**, a New Anæsthetic. *Die Ophthalmologische Klinik*, August 20th, 1905.

L. JACOBSON (Berlin). **Alypin**. *Wochenschrift für Therapie und Hygiene des Auges*, viii., 52.

YET another new local anæsthetic is described; the number is now becoming extraordinary. Alypin—its chemical name is too long for reproduction—is a derivative of glycerin manufactured by Drs. Hofmann and Impeus, and is a white crystalline powder freely soluble in water, the solution being neutral. The alkaline fluids of the body do not break it up, and it is thus rapid in its action on the tissues. Boiling for five to ten minutes for sterilisation does not seem to injure alypin, but it is recommended that the process should not go on longer. The solution combines freely with adrenalin solution without injury. A 4 per cent. solution, or even 2 per cent., will keep well, but when more diluted it is apt to become fungoid in the same way as cocain. It can be used either by dropping on the mucous membrane or by subcutaneous injection, and never gives rise to local damage even in 5 per cent. strength. In comparison with cocain the local anæsthetising power of alypin is much the greater; thus, experimenting with rabbits, Impeus found that he could obtain a distinct effect with any concentration above 0.005 per cent., whereas the lower limit with cocain is stated to be 0.01 per cent.; a few drops

of a 1 per cent. solution of alypin produced a complete anaesthesia of the cornea lasting from fifty to sixty seconds.

The toxicity of alypin is, moreover, much less than is the case with cocain, though in regard to ophthalmic work this is not a point which with any frequency attains importance. A striking difference exists in the local and subcutaneous action of the two anaesthetics, for alypin dilates the vessels instead of causing their contraction.

When a 2 per cent. solution of alypin is dropped into the conjunctival sac there is a slight feeling of smarting, not greater than is the case with cocain of similar strength, and anaesthesia is present in about 60–70 seconds; this lasts from one to two minutes, and the iris and ciliary muscle remain unaffected. The conjunctiva becomes somewhat hyperæmic, as explained above. Impeus has never seen any damage to the corneal epithelium occur, and recommends alypin for use before the application of painful remedies to the conjunctiva or the performance of minor operations upon the eye.

A last recommendation is that the price of alypin is much less than that of cocain.

W. G. S.

WE are asked to state that an investigation as to the *Heredity of Albinism in Man* is being carried out by Professor Karl Pearson, F.R.S., of University College, London, with the co-operation of Mr. E. Nettleship (Shottermill, Surrey, England) and Dr. E. Stainer (Physician to the Skin Department, St. Thomas's Hospital, 60, Wimpole Street, London, W., and that cases bearing on the subject—*either positively or negatively*—will be very thankfully received by any of those gentlemen. The investigators desire to collect a large series of examples of Albinism—complete or incomplete, general or partial—in which the family history of the albino patient can be traced for one, two, three, or more generations. The sex and prevalent colour of eyes and hair in as many of the patients' relations and ancestors as possible should also be noted, whether any of them were albinotic or not; also all instances of consanguineous marriage. Cases of Albinism of the eyes in persons with congenitally pied skin (most easily recognised amongst dark races) will also be very valuable even without family history—acquired leukoderma being of course excluded.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Meeting held November 9th, 1905.

The President, Mr. PRIESTLEY SMITH, in the Chair.

CASES AND CARD SPECIMENS.

Tubercular Tumour of the Choroid.—Mr. A. Hugh Thompson and Mr. E. C. Taylor.

The patient, a girl aged 22, while suffering from tuberculosis in various parts of her body, lungs, glands, skin, etc., and having undergone several operations, including amputation of the right arm above the elbow and excision of the left eye, began to find the vision of her remaining eye becoming defective. This was found to be due to cyclitis, and later on to widespread detachment of the retina; still later the lens appeared to be pushed forward, and the anterior chamber became much diminished in depth. The eye, after becoming blind, was excised when the tension was $1\frac{1}{2}$ and no fundus reflex was visible. After excision the eye was found to be filled with a whitish tumour extending from the ciliary body two-thirds of the distance to the disc, projecting 5 mm. into the vitreous. The retina was completely detached. In a section which was shown, numerous giant cells with their nuclei arranged round the periphery and the complete absence of blood vessels were notable features.

Growth of Conjunctiva of doubtful nature.—Mr. E. J. Smyth.

The patient, a girl aged 12 years, suffered some discomfort from her left eye, which was continually red and inflamed. Her mother had noticed a small patch on the white of the eye "like a skin" when the child was two years of age, and this had increased in size, becoming red some years ago. The ocular conjunctiva of the left eye showed a roughly crescentic growth above and to the outer side of the cornea; this encroached upon the upper and outer part of the limbus, was pale red in colour though not markedly vascular, being somewhat gelatinous looking and uniform except for a small white patch at the edge of the cornea near the centre of the mass. It was movable over the sclera.

The Back of an Eye from a case of Amaurotic Family Idiocy.—Dr. F. J. Poynton and J. Herbert Parsons.

This specimen was taken from a child, the youngest of a Jewish family in which this disease had manifested itself; this child during life had presented the usual symptoms and retinal changes of the disease. On removal of the posterior half of the globe, and on floating it in water it was found that there was a minute hole in the retina at the macula,

and at the macula itself—if there was any retina at all.—it was so thinned and atrophied that its presence could not be detected, but just round this hole the retina appeared considerably thickened. The choroid was cherry red in colour, and the explanation of the cherry red spot could be strikingly demonstrated by floating a strip of white paper between the choroid and the retina when the spot vanished, to reappear when the paper was removed. The red spot was produced by the choroidal pigment seen through the minute aperture, its vivid colour being made more apparent by the zone of pallor—the result of thickening of the retina—round it.

Obstruction in a Main Branch of the Central Artery of the Retina in a subject of Interstitial Nephritis.—Mr. A. Hugh Thompson.

The patient, a man aged 57, had worked as a builder's labourer until $3\frac{1}{2}$ years ago, when he felt compelled to give up on account of giddiness. A few months ago he found the sight of his left eye defective. With the ophthalmoscope the superior temporal branch of the artery was seen to be completely blocked, and beyond the block to be represented by a system of white branching bands containing in places a slender column of blood. One of these branches near the disc was replaced for a short distance by a number of minute vessels containing blood, and adjacent to the other blocked branches were numerous evidences of hæmorrhage. All the blocked vessels appeared to be arteries, though the contained blood was dark; no veins could be made out with any certainty in the quadrant corresponding to the blocked vessel. In other parts of the fundus the veins appeared to be compressed by the arteries where crossed by them. The margins of the disc were clear. The patient was reported to be suffering from chronic interstitial nephritis with marked cardio-vascular consecutive changes, and from hypertrophy and dilatation of the left ventricle with mitral incompetence, aortic atheroma, etc.

Unusual case of Spring Catarrh.—Mr. Sydney Stephenson.

The patient, a girl aged 8 years, had been the subject, for some three years, of a running itching eruption on the skin, which always made its appearance in the spring. Since this last spring her eyes had been more or less pink, with photophobia, and much lachrymation accompanied by an itching feeling in her eyes. At the inner and outer margins of the right cornea were a number of fleshy looking growths resembling phlyctenulæ but not encroaching upon the cornea anywhere, and quite devoid of superficial ulceration. The left eye showed a number of similar growths all round the cornea, but much more marked at the inner and outer side of the cornea. These overgrowths might be described as jelly-like with a distinct pink tinge. The palpebral con-

conjunctiva was merely reddened and showed no trace of elevations, but the lower palpebral conjunctiva of both eyes showed a milky appearance. The eruption on the face had been diagnosed by Mr. Jonathan Hutchinson as "summer Prurigo." Treatment with Adrenalin drops, dark glasses, and general nourishing regimen had brought about marked improvement, but the overgrowths still remained the same except that perhaps they were now less vascular than before. The two chief points of interest in connection with this case were the unusual form assumed by the disease, and its association with a recurring eruption on the skin. A previous case had been reported before the Society in 1898 under the heading of "An unusual form of marginal keratitis" in association with "a severe eczematous" eruption on the face, skin, and body (*Trans. Ophthalm. Soc.*, vol. xix., 1899).

Case of Keratitis Parenchymatosa (Traumatic).—Mr. Arnold Lawson.

This patient, a young man, showed a large disc-shaped opacity in the centre of the left cornea. No network was visible in the opacity, but on minute examination it was seen to vary in density. The cornea was clear between the central opacity and the margin, but no vessels appeared to run into the opacity from the conjunctiva. There was a history of injury some fourteen days previously (a blow from a splinter of wood), the eye had become inflamed some three or four days later. This appearance corresponded very closely with keratitis disciformis described by Fuchs and of which a case is illustrated in vol. xxiv. (No. 283), May 1905, of the *Ophthalmic Review*.

The Value of the Opsonic Index in Phlyctenular Conjunctivitis.—

Dr. J. B. Nias and Mr. Leslie Paton.

This paper consisted of some preliminary observations made in connection with phlyctenular conjunctivitis which has long been regarded as strumous in origin. It was hoped that by following the methods of Dr. Wright, an actual association between phlyctenular conjunctivitis and tuberculosis could be shown to exist, and the difference between tubercle of the conjunctiva and phlyctenular conjunctivitis discovered, if both are caused by the tubercle bacillus.

The first point to which attention was called was the fact that definite tubercle of the conjunctiva was met with, though infrequently, and was very definitely differentiated from phlyctenular conjunctivitis, since in the latter tubercle bacilli have never been met with, but in the former always.

A second fact on which stress was laid was that patients with phlyctenular conjunctivitis usually showed some lesion of tubercle such as enlarged glands.

Thirdly, the assumption was made that tubercle bacilli were not present in phlyctenules since their presence therein had never yet been demonstrated. Comparing definite tubercular lesions of the conjunctiva and phlyctenular conjunctivitis, with two supposedly tubercular lesions of the skin, lupus vulgaris corresponding to the first-mentioned and erythema induratum to the second, very much the same relations were found to obtain. The one—lupus—has long been known to be definitely due to tubercle bacilli, the other—erythema induratum—has long been associated with tuberculosis, though the bacilli had never been shown to be present; it has been supposed to be due to the action of tubercle toxins circulating in the blood. The writers held that phlyctenular conjunctivitis was brought about in a similar manner, *i.e.*, by the tubercle toxins circulating in the blood. One fact which has some bearing in this direction was that after inoculations with tuberculin a crop of phlyctenules has on more than one occasion appeared. One case was reported in which twice, following upon inoculations, a transitory inflammation of the conjunctiva had occurred, both of which attacks cleared up in forty-eight hours; this case was one reacting favourably to the treatment—tuberculin—for lupus vulgaris, a steady rise of the opsonic index resulting, and the patches of lupus clearing up. Cases of tubercle might be divided into two classes: in the first there is a purely local infection with no general systemic affection, *e.g.*, tuberculous glands, lupus, etc.; this class is characterised by a persistently low index and the frequency of phlyctenular conjunctivitis. In the second class periodic systemic infections take place, characterised by sudden rises of the index far above the normal, *e.g.*, phthisis. The writers recommend favourably the treatment by means of tuberculin of those cases of persistently recurring phlyctenules with a low opsonic index.

Dr. L. B. Nias explained that this treatment was based on the property which serum possesses of inducing phagocytosis, which is one of the methods by which an infected organism frees itself from the invader, the other method being by neutralizing the toxins with anti-toxins. [The opsonic index or ratio is the relative number of bacteria taken up by the leucocytes of the infected individual, an equal number of cells being taken in the two cases.] Charts of two or three cases were also exhibited, showing the rise of the opsonic index after each injection, and subsequent fall.

Metastatic Sarcoma of the Nerve Head and Retina.—Dr. A. J. Ballantyne.

The patient was a woman aged 58, suffering from paresis of the right side of the face, right arm and leg, and left internal rectus muscle, with

blindness of the left eye ; all these symptoms were said to have come on suddenly a week before her admission to hospital. The left eye was divergent and the pupil of it inactive to light, though reacting consensually. Ophthalmoscopically the left fundus showed a large oval creamy white, shimmering patch, situated in the position usually occupied by the disc, but about three times its normal size ; the disc was unrecognisable. This mass projected into the vitreous, and the vessels emerged from underneath it or from its margins, all of which latter were well defined except its temporal one, which gradually merged into the surrounding fundus. Flame-shaped hæmorrhages were scattered over the fundus lying alongside the vessels. The vitreous was filled with opacities. The patient had become weaker and had died about a fortnight after the supposed onset of the symptoms. *Post-mortem* foci of softening were found in each hemisphere of the brain, and in the pons and corpus striatum. A tumour growing round the large vessels was found in the mediastinum penetrating into the upper and lower lobes of the left lung. A similar tumour involved the left suprarenal body and to a less extent the right one. An enlarged lymphatic gland was present in the abdomen, and a growth in the subcutaneous tissue of the abdominal wall. On bisecting the left eyeball, the large projecting mass seen with the ophthalmoscope proved to be in continuity with the optic nerve and with the retina, passing into it on each side, and at each side the retina was found raised from the choroid, leaving a space filled with exudate ; the intervaginal space was also much widened. Microscopically all the masses of growth including that on the nerve head were found to be sarcomatous, the intra-ocular portion of the growth was all necrotic with the exception of a zone of cells of uniform thickness surrounding the central vessels and lying in front of the choroid ; the lamina cribrosa was well preserved. In the retina the greater part of the tumour (the necrotic part) was found to be in the nerve fibre layers. The writer considered that probably the mediastinum was the seat of the primary growth, which had penetrated the walls of the pulmonary veins and had been carried by the blood stream to the optic nerve and other parts ; the foci of cerebral softening could also have been caused by similar emboli. A series of lantern slides were shown.

Notes on some varieties of Albinism.—Mr. Nettleship.

Colour Blindness in Women.—Mr. Nettleship.

Case of Cysticercus in the Retina.—Dr. D. J. Wood.

Case of Hydatid in the Retina.—Dr. D. J. Wood.

REGINALD E. BICKERTON.

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CASE OF TUBERCULOSIS OF THE CON- JUNCTIVA.

BY

A. FREELAND FERGUS, *Glasgow*;

With Report on the Pathology by W. B. INGLIS POLLOCK,
Glasgow.

TUBERCULOSIS of the conjunctiva is certainly a somewhat rare condition, especially in the form in which it occurred in the young child whose case I am about to describe, for in what is now a fairly large clinical experience I have met with no similar case, although, as we shall afterwards see, the condition is spoken of in most of the recent textbooks which deal with the pathology of the organ of vision.

The little boy was sent to me by Dr. Adams, of Hamilton. On everting the upper lid I observed a tolerably large ulcer involving the palpebral conjunctiva. This was surrounded by numerous sprouting granulations, which were in large part covered by small bodies closely resembling miliary tubercles. Another feature in the case which tended to confirm the diagnosis was the enlargement of the preauricular gland and of another gland behind the ascending ramus of the inferior maxilla on the same side as the affected lid. The ulcer was of considerable dimensions, being about four millimeters long. Only the conjunctiva of the upper lid and slightly that of the retrotarsal fold were involved; the conjunctiva of the eyeball had escaped altogether.

To make assurance doubly sure a small portion of the tissue was examined by Dr. Inglis Pollock, who found tubercular bacilli.

Under these circumstances it seemed to me that the obvious course of treatment was to excise thoroughly all the diseased tissue. With Dr. Adams' assistance this was easily accomplished, the lid was everted after division of the external canthus and every part of the diseased tissue was carefully removed. Before the child was allowed to come out of the chloroform the affected glands were both excised: one of them was found to be in an advanced state of caseation. At the time of this operation no other manifestation of tuberculosis was observed, and I incline strongly to the opinion that it was a primary lesion of the lid. The child made a good recovery, and there has not been any recurrence: Dr. Adams informs me that recently he has passed through a severe attack of whooping cough, but is again doing well.

The fact that the disease was confined to the conjunctiva of the upper lid made the treatment all the easier, for there was no fear of any resulting symblepharon.

The literature of the subject is very considerable. Such cases are described by many authors. Thus we find this form of tuberculosis referred to by Swanzy, who incidentally mentions Valude and Leber as being of opinion that conjunctival tuberculosis is usually a primary affection. Swan Burnett gives a good description of the disease in his article in Norris and Oliver. A classical description of the condition from the clinical side was given by Haab so long ago as 1879, and indeed most authors who write on conjunctival diseases mention such cases, although Swanzy is probably correct when he says that they are very rare. It only remains to call attention to the writings of such authors as have dealt specially with the pathology of eye affections. An excellent epitome of the

whole question is given by Mr. Herbert Parsons in Vol. I. of his well-known book, p. 79. Following Eyre, he divides cases of conjunctival tuberculosis into five groups.

Group 1 is "characterised by the presence of one or more small miliary ulcers, which usually caseate, and may or may not coalesce; these generally attack the palpebral in preference to the bulbar conjunctiva."

Group 2 is "characterised by the presence of greyish or yellowish sub-conjunctival nodules, varying in size but rarely larger than a hemp-seed."

Group 3 is "characterised by the presence of florid hypertrophied papillæ and rounded, flattened outgrowths of granulation tissue, sometimes derived from tarsal conjunctiva."

Group 4 is "characterised by the presence of numerous pedunculated 'cockscomb' excrescences on the fornices, of a jelly-like consistence, and often showing more or less superficial ulceration."

Group 5 is "characterised by the presence of a distinctly pedunculated tumour (very rarely more than one may be present) having the microscopic appearances of a papilloma or fibroma of the tarsal conjunctiva."

In addition it must be remembered that lupus often extends to the conjunctiva. The case which has just been described obviously belongs to the first of these divisions.

Ginsberg ("Grundriss der pathologischen Histologie des Auges," page 41) gives a good description of such tubercular ulceration. The bottom of the ulcer is circumscribed by irregular indentated margins, the surrounding tissue showing miliary tuberculosis. Small ulcers originate by the breaking down of the tubercules

and the process gradually extends both in superficies and in depth. The process shows little tendency to spontaneous healing.

Greeff, in Orth's book, follows Sattler's classification dividing cases of conjunctival tuberculosis into four groups. The first contains such cases as the present, and he says that the preauricular gland is almost always involved. Microscopically sections show typical miliary tuberculosis with central caseation, the broken down tissue being surrounded by connective tissue rich in cells and highly vascular. At the base of the ulcer are found numerous caseous masses. Bacilli are usually present in considerable numbers.

All the excised tissue was sent to Dr. Inglis Pollock. The following is his report.

REPORT BY DR. INGLIS POLLOCK.

The portion of tissue handed to me for examination had been removed from the ulcer, and included one or two prominent granulations. The floor of the ulcer is composed of a dense cellular collection. There are numerous round cells, a number of epithelioid cells, and a few stroma cells and leucocytes. Large numbers of fragmentary nuclei are present, and at certain spots the whole tissue shows caseation necrosis. The projecting granulations have also passed into a similar condition. There are no giant cells, nor indeed any typical tuberculosis, but sections treated with the Ziehl Neelson stain contain a number of tubercle bacilli. The base of the ulcer shows increased vascularity of the conjunctival tissue.

REVIEWS.

H. VILLARD (Montpellier). **Tuberculosis of the Conjunctiva.**
Annales d'Oculistique, iv. and viii., 1905.

THERE have been so far from 140 to 150 cases recorded. It occurs at any age from 10 months to 71 years, but 72% of the total number were below 20 years of age. It is rather more common in males (56%) than in females. It has been noted in all countries and climates, but only once has it been recorded as occurring in a negro. Usually the subjects of the disease are otherwise healthy. Traumatism rarely is the cause, but one case apparently originated from the bite of a dog that had just eaten the placenta of a tuberculous calf. Direct contagion is sometimes the means of setting up the disease.

Pathogenic theories:—1. Endogenous: In three-fifths of all cases this was not possible, as no primary source could be found. 2. Direct extension: Nasal origin only recognised in four cases of the series. 3. Exogenous: If primary, this is the only reasonable explanation, but experiments apparently do not confirm this view. Inoculation only succeeds if made subconjunctivally. Injection into the lachrymal gland or sac always fails. One explanation suggested is that the tubercle gains entrance through an abraded phlyctænula, but in 70% the tubercle is found on the lids. Fuchs supposes its entrance through small excoriations.

Symptomatology.—The first sign may be conjunctival blennorrhœa that does not yield to the usual treatment; some weeks or months later the stage of full development is reached. The lids are swollen, muco-purulent discharge escapes, and granulations or ulcerations appear at the side of the lesion. The cornea may or may not be affected. There is enlargement of the neighbouring glands, especially the pre-auricular, but it may be also the cervical or the submaxillary. Photophobia is variable, but is very marked if the cornea is invaded, and in the same circumstances there is pain; otherwise this is practically absent. Lachrymation is usually marked, and the secretion, whether mucus, muco-pus, or pus, is abundant. The lids have a bluish appearance, and are constantly swollen, but are always soft, however; the conjunctival surface is

velvety and forms projecting folds round the tuberculous foci. The mucosa is markedly injected and thickened, and its papillary tissue is notably hypertrophied.

The tuberculous nodules have their seat in 70% in the palpebral conjunctiva, in 22% on the bulbar, and in 8% in the fornices. The granules may be disseminated or massed together; large numbers are found at the margin of any ulcer. They are usually multiple and form constantly afresh as they are destroyed by ulceration. Their usual form is round or oval; in size they are very variable; and in colour, also, may be grey, yellow, or red. In some cases there is no ulceration, and their nodules contain but very few bacilli.

Not uncommonly there is but one ulcer, and only rarely does an ulcer extend beyond the size of a pea. The ulcers have irregular margins, crater-like sides, and a hard base which presents fungating granulations that are covered by exudation. The surrounding conjunctiva is not infrequently studded with tuberculous nodules. There is no tendency to cicatrisation, but slow and steady extension takes place and causes perforation of the tarsus or sclera, as the case may be. In some rare cases ulceration is absent and there is hypertrophy and thickening with the formation of a dense nodular mass, a condition that is proved to be tuberculous by inoculation into animals. An excrescence in the shape of a cock's comb or papilloma is very rare. When the cornea becomes affected a diffuse haze appears, and sometimes a row of granulations springs up at the limbus. Now and then a veritable pannus develops, and very rarely complete destruction of the cornea takes place. Propagation of a lesion to the lachrymal apparatus is very rare. Experimentally, three varieties of lesions have been produced, viz., cold abscess, fungosities, and tuberculous granulations. In 85% there is enlargement of the neighbouring lymphatic glands.

In the pus taken from an affected gland Koch's bacillus is very rarely found, but inoculation in animals gives a positive result.

Generalisation of tuberculosis from the conjunctiva is very uncommon, but cases are recorded in which tubercular meningitis, general miliary tuberculosis, pulmonary phthisis, and diaphragmatic pleurisy supervened and resulted in death, the fatal event even occurring after a local cure.

Five clinical forms are distinguishable, viz., miliary, ulcerative, fungoid (rare), polypoid and papillomatous (exceptional), and lupus.

The prognosis is grave, although spontaneous cure has taken place in an odd case, and if well and vigorously treated the disease usually yields.

Diagnosis.—1. Clinical. It has to be distinguished from: (a) Chronic blennorrhœa; (b) Trachoma. Great difficulty sometimes arises, but the special points in favour of tubercle are the lardaceous aspect of the mucosa, the characteristics of the ulceration, the presence of tuberculous nodules, and the enlargement of the lymph glands.

(c) Epithelioma. The age is important and the presence or absence of the fine yellow tuberculous grains.

(d) Chancre is larger, less grey, less fungoid, softer at the base (?), is always single, and is more indolent. Reaction to treatment will prove the nature of the lesion.

(e) Gumma is painless, does not invade surrounding tissue, produces no enlargement of glands, ulceration thereof is deep, and the base is covered by a grey pellicle.

(f) Leprosy is very rare on the conjunctiva, but when it is present it is situated at the corneal limbus and affects the cornea. Further, there is a characteristic dirty brown pigmentation present.

(g) Infectious conjunctivitis of animal origin (Parinaud). There is in this disease no ulceration, although there are yellowish dots, and swelling and suppuration of the preauricular gland. There is also a tendency to spontaneous cure.

(h) Granuloma of the conjunctiva, which occurs after rupture of a chalazion or more rarely round a foreign body impacted in the conjunctiva. Here giant cells occur, but granulomata are redder, more localised, harder, and more healthy looking than a tuberculous mass.

(i) Lymphoma. Here the follicles are distinguished from tubercular nodules by their large size and by the fact that they never ulcerate; similar tumours are present in the neck, and there is hypertrophy of the spleen and leucocythæmia.

(j) Pseudo-tubercles produced by caterpillar hairs. The

nodosities in this affection develop round the hairs in the conjunctiva, cornea, and iris.

(*k*) Lupus of the conjunctiva, especially when primary, is very rare. It begins always as a pediculated mass; there is never a depressed ulceration, and there are no miliary tubercles. No enlargement of glands occurs unless some inflammation is superadded. Lastly, its progress is excessively slow, extending over years.

2. *Experimental Diagnosis.*

(*a*) Histological examination is not perfectly trustworthy, because the tuberculous lesion does not always present typical appearances, and, further, giant cells are sometimes found in simple granuloma.

(*b*) Search for bacilli. The conjunctival secretion rarely contains bacilli; the same is true of scrapings. In sections of fragments of affected conjunctiva bacilli are found, but they are very few and scattered, and may even be entirely absent. The pus of an affected gland may or may not contain the micro-organism.

(*c*) Injection of tuberculin. If there is no other tuberculous centre, this method may be employed.

(*d*) The tuberculous sero-reaction (method of Arloing and Paul Courmont) has only been used in one case, but if it is irrefutably shown that this method is all it claims to be it will prove a most valuable diagnostic aid.

(*e*) Inoculations into rabbits or guinea-pigs of scrapings, fragments of conjunctiva, or pus almost always produce characteristic reactions.

Treatment.

(*a*) By medicaments. Numerous local applications, including the Röntgen rays, have been used, but none are perfectly efficacious. Superalimentation, cod-liver oil, and tonics, or iodoform internally should be given.

(*b*) Subcutaneous injections of tuberculin has been tried in animals artificially inoculated, with most contradictory results, but in man it has given fair satisfaction. This method is, therefore, advisable where the surface affected is so extensive that it cannot be treated surgically without risking troublesome after-events such as symblepharon. Tuberculin has the advantage of being selective in its action.

(c) Surgical methods. Curettage is not sufficient in itself, but should be followed by the application of lunar caustic, or, better still, the actual cautery. Excision is good if complete, and the risk of allowing bacilli to enter the opened mouths of blood vessels is avoided. Cauterisation, however, is the treatment *par excellence*.

J. GRAY CLEGG.

E. RAEHLMANN. **Trachoma.** *Beiträge zur Augenheilkunde.*
Heft 62.

THE work is divided into three parts—(1) histology; (2) results of (so-called) “ultramicroscopic” examination by the instrument of Siedentopf and Zsigmondy; (3) therapeutics based on physiologico-chemical and ultramicroscopical investigations.

Raehlmann regards follicular conjunctivitis and trachoma as merely different stages of the same affection. The former is simply a mild form of the latter.

Of the chief pathological appearances, the follicle, the so-called conjunctival glands with centrally softened epithelial vegetations, and the papillary prominences, Raehlmann holds that they are all different stages of the lesion originating in the follicle. The follicle may absorb and disappear completely, but the usual course is for it to ulcerate, and all the other lesions seen are results direct or indirect of this ulceration.

This ulceration is the natural course the disease follows, and the treatment by “expression” is useful as hastening the process. The so-called “glands” found in the conjunctiva are results of the escape of the contents of the follicles with proliferation of the surrounding epithelium which spreads down into the defects of the mucous membrane, just as the corneal epithelium does into the corneal wounds.

Ultramicroscopical observation shows that the defects are also filled up by a mass of small bits of protoplasm and fragments of nuclei, which have wandered from the tissue cells through the epithelium. On the warm stage these bodies exhibit vital movements.

In all the cases of trachoma examined Raehlmann found the contents of the follicles to be made up of numerous morsels of

protoplasm (the remnants of tissue cells) and bacteria, which exhibited vital movements on the warm stage. The micro-organism appeared in five forms—(1) a biscuit-shaped body; (2) the same arranged in chains of bacteria; (3) as diplobacilli “Doppelgebilde”; (4) as small rods (hantelförmig); (5) punctate or spherical particles. In Raelmann's opinion all these are different stages in the growth of the same micro-organism, and they all exhibit rapid movements. Besides the vital movements of the bacteria innumerable little particles of protoplasm are seen with similar movements. These particles are portions of broken-down cells, or nuclei.

Raelmann believes the disease can be transmitted by either the bacteria or the particles of protoplasm, and it is consequence of their agglutinating action on albumen that nitrate of silver and sulphate of copper are so effective in treatment of trachoma.

Raelmann leaves it undecided whether the bacteria seen by him are the same micro-organisms described by L. Müller.

The physiologico-chemical investigations in the third part of the work go to demonstrate the reason why sulphate of copper is so much more effectual than the other remedies commonly employed in treatment of trachoma.

It is difficult to give a satisfactory abstract of this paper, which should be consulted in the original by those interested in the pathology of trachoma.

J. B. S.

CLEMENS HARMS (Tübingen). **Disease of the Central Artery and Vein of the Retina**, with special reference to Haemorrhagic Infarct of the Retina. *Archiv für Ophthalmologie*, lxi., Band. 1 & 2.

It is with some degree of hesitation that the attempt is made to compress into small space even a short review of this very long article, which is manifestly the product of much patient research and consideration.

It is possible that the majority of English readers will find the paper too long, especially as, in the absence of an index further than the table of contents at the beginning, it is not easy to find any particular part to which one may wish to refer.

As the title indicates, the object of the paper is to give the results of the anatomical examination of cases of affections of

the central retinal blood vessels, especially the so-called hæmorrhagic infarction.

The work is divided into three parts, the first of which occupies eleven pages, and is concerned with the writer's introduction and the technique employed in conducting the research. The second part is divided into three sections, and deals with the various types of cases in very full detail. This portion occupies 220 pages. The third part is short, and in it are taken up various points of anatomical and pathological interest.

To these various sections of the paper are appended a long list of the published works which bear upon the subject, five whole-page plates containing thirty-two figures, and also descriptions of these latter. It will be understood that the paper is very full indeed, when it is mentioned that there are incorporated in the text fourteen figures in addition to those above noted, and also that there are three very long and full tabulated statements of the recorded cases.

The three divisions of the second and principal part of the work are concerned with—(1) Affections of the central retinal artery which give the clinical picture to the so-called embolism, etc.; (2) Affections of the central retinal vein which pass under the name of retinitis hæmorrhagica, etc.; (3) Affections of the central retinal vessels which are termed, clinically, embolism, retinal apoplexy, and retinal infarction.

The author enriches the literature of this interesting subject by exceedingly full records of thirteen cases which he has himself examined, and most of the figures in the text are schematic representations of the condition of matters found in the blood vessels in the various cases.

It is very important, in connection with the subject of clot formation in the vessels, to notice that Harms freely admits the exceedingly great difficulty which is experienced in distinguishing between a newly-formed and an old clot, that is to say between a clot imported into its position and a clot formed in its position. He is particular in stating the requirements which he considers it necessary to establish before coming to a conclusion that a clot is embolic. They are as follows: (*a*) The closure of a vessel by the importation of a structure into a position formerly freely open and free from disease of the vessel-wall: (*b*) A source for the embolus must

be established (*see note); and (c) The absence of signs of preceding thrombosis in the vessel.

It may fairly be represented that the writer's opinion is that there are remarkably few of the cases of which the clinical history and clinical picture indicate the occurrence of embolism in which the diagnosis can be confirmed by anatomical examination.

The various cases of arterial closure recorded almost all come under one or other of the following heads:—

Thrombosis in a previously free lumen without thickening of the intima.

Primary endarteritis proliferans.

Calcareous concretion in the vessel wall.

Combination of the first and second.

The actual closure is brought about by progressive thrombosis which supervenes on the diminution of the blood current.

Harms concludes that no general rule can be come to from the clinical symptoms as to the nature of the lesion, and suggests that the name "embolism" be given up in favour of one less inaccurate, such as "Thrombosis of the Central Artery," or even "Sudden Closure of the Central Artery." The last word on the subject is this: "Eine wirkliche Embolie der Zentralarterie im Sinne v. Gräfes ist bisher nicht anatomisch erwiesen."

The author passes on in the second part to discuss the various lesions which are found in cases which are described as hæmorrhagic retinitis, etc., and shows that the closure of the vein may be due to four classes of cause, as follows:—

Clot formation in a previously free vein.

Primary disease of the vessel wall.

Combination of the first and second.

Clot formation due to compression from the outside (one case).

The various cases are discussed fully and the mode of action explained.

Of Michel's dictum regarding the three points of importance in cases of venous closure, *i.e.*, sudden onset of blindness, distended veins, small arteries and large hæmorrhages, and

* Note.—One author found that of 95 cases of so-called embolism, 66% had no known source for the embolus.

absence of glaucoma, Harms says that whilst the first remains true, the hæmorrhages may, if there is disease of the blood vessels, be small and punctate or flame-shaped, and that glaucoma does sometimes supervene. Regarding this last point he adduces six or seven cases in which this complication did occur.

In the last part the author takes up cases in which both artery and vein are involved in some degree in the disease. Under group *a* are classed those cases in which whilst both vessels are diseased, the vein is more so than the artery and still the affection has the clinical appearances of embolism. Group *b* includes cases in which whilst both vessels are completely closed, the picture is that of hæmorrhagic retinal apoplexy. As an appendix to this group cases are quoted in which, whilst the clinical picture is that of retinal apoplexy, the vein is found not to be closed. Group *c* contains records of cases in which, whilst both vessels are diseased, the clinical history and picture are those of retinal infarction.

In section three of the work anatomical and pathological details of the subject are dealt with. Harms dwells on the fact that of twelve cases investigated by himself the course of the vein in the nerve behind the eye was abnormal in three (25%). This is certainly a rather striking and suggestive fact in several respects.

In connection with the whole subject it is interesting to find that of 70 cases quoted, of all varieties, 42 had glaucoma at some stage. This includes the author's own thirteen cases, all of which became glaucomatous. It is, however, pointed out that it is mostly in the cases in which glaucoma occurs that an opportunity of making an examination of the eye is afforded to the surgeon, as excision is usually the result of pain and high tension. This notwithstanding, it is important in regard to the view which some take respecting the pathology of glaucoma at the present time.

Of the work as a whole it may be said that the author throws considerable light on the subject of investigation, and that it is well worthy of perusal by those specially interested in the class of case under consideration. Further, it must be admitted that, although the wealth of detail given swells the paper to somewhat gigantic proportions, it is useful in so far as subsequent workers will reap the benefit.

. LESLIE BUCHANAN.

VAN DUYSE (Ghent). **An Epibulbar Tumour showing Cell Vacuolation.** *Archives d'Ophthalmologie*, Sept., 1905.

A SLIGHTLY lobulated, pale yellow tumour, the clinical diagnosis of which was cutaneous lipoma, was removed from a child three years of age. The tumour was situated on the upper nasal portion of the sclera and extended from the conjunctival cul-de-sac to the cornea and encroached thereon about 2 mm. Its long diameter from below upwards and outwards measured 18 mm.; the transverse diameter perpendicular to the first, 9 mm. Conjunctival vessels ran over the new growth. The tumour when removed from osmic acid showing absence of black colouration, the diagnosis of cutaneous lipoma was immediately rejected.

The essential elements of the tumour are made up of newly-formed, vacuolated cells. These elements occupy the whole thickness of the conjunctiva, but their mass is separated from the epithelium by a wavy bundle of tissue which is stained deeply by fuchsine and contains capillaries filled with blood.

Occasionally, between this band of tissue and the cell elements, there are seen fusiform connective tissue cells, the protoplasm of which is still intact or partly vacuolated. The cell elements are grouped together in small masses between the tissue stroma. In certain places the vacuolated cells are packed tightly, giving the appearance of having run together into one protoplasmic mass. The cell elements are chiefly oval in shape, but when the fibrous reticulum is absent they become rounded or polyhedral in section. The vacuolated cells are multinuclear, the nuclei being placed at the periphery of the cells or in a circular manner around a central mass of protoplasm. The vacuoles all appear to be about the same size. The hæmatoxylin-iron stain of Heidenhein shows the nucleoli and the chromatic network of the nuclei.

Sick (Bernie) has recently reported a tumour similar to the above taken from the thigh of a woman aged 50. The characters of xanthoma of the conjunctiva as described by the writer are similar to those of this tumour, and he thinks it is the analogue of xanthoma without the presence of fat globules. In origin the tumour is an endothelioma with vacuolation of the protoplasm of the cells.

H. HORSMAN McNABB.

G. HOTTA. **Experimental Investigations on the Infection of Corneal Wounds by Saliva.** *Klin. Monatsbl. für Augenheilkunde*, September, 1905.

SALIVA may be brought in contact with corneal wounds by means of objects contaminated with saliva, such as fingers and handkerchiefs, or drops of saliva may come from the operator's mouth.

The writer's experiments were partly to determine (*a*) what organisms in the saliva, when in contact with a newly-made corneal wound, are most likely to produce a purulent keratitis, and (*b*) what form of wound, exposed to the micro-organisms of the saliva, is most likely to give rise to purulent inflammation.

For his experiments rabbits, cats, and mice were used. Saliva was obtained from persons of different ages and positions. The lids were everted and the eye washed with 0·05% sublimate lotion, then with physiological saline solution.

A wound was made in the cornea:

(*aa*) Non-perforating.

1. An abrasion by scratching the surface of the cornea with the point of a needle.
2. A pocket, a wound made by a keratome between the corneal lamellæ.

(*bb*) Perforating wounds made by a Græfe knife.

Saliva taken from a sterile Petrie dish, by means of a sterilised spatula, was carefully rubbed on the wound, or inserted into the pocket. In the case of perforating wounds care was taken not to introduce the spatula into the anterior chamber.

After 24 hours a cover-glass preparation from the secretion of the wound and a culture were made. The media used were neutral agar, glycerine agar, Löffler's blood serum, and bouillon. All media were placed in an oven at 35°C.

Results of 90 experiments:—

- (*a*) Always negative in 30 perforating wounds.
- (*b*) Once positive in 30 abrasions.
- (*c*) Always positive in 30 pocket wounds. In most of these cases there was iritis, hypopyon, marked circumcorneal injection and conjunctivitis.

In these 30 cases Pneumococci were found 11 times (36%); Streptococci 17 times (56%); Staphylococci 9 times (30%); Tetrigenus was also seen 5 times. In six of the cases no culture was obtained.

Infection of operation wounds by drops of saliva from the operator: Hotta performed experiments similar to those of Hübener, but modified them in view of the special conditions present in eye operations. He found that a veil of doubled muslin does not absolutely prevent the spraying of the saliva. But he believes that in eye operations this is certainly sufficient to prevent infection from the mouth. The possibility of infection from the saliva during the operation cannot be absolutely denied, yet it must be so rare that in eye operations in general a special measure to prevent it does not seem necessary.

C. H. U.

BISTIS (Athens). Traumatic Enophthalmos and its Pathology.
Archives d'Ophthalmologie, September, 1905.

TRAUMATIC enophthalmos may develop as a result of injury to the walls of the orbit, thus increasing its capacity with consequent sinking of the eye, or as a result of injury in the neighbourhood of the eye indirectly causing it to sink into the orbit. The latter is the true type of traumatic enophthalmos.

A patient of Bistis' received an injury in the region of the right eye as a result of a fall from a horse. Twenty days later the patient noticed the eye to have sunk in the orbit. On minute examination the tension, vision, fundus, field of vision, and pupil reaction were normal. Various theories are held as to the pathology of this affection. Gesner and Low think it is due to retraction of the orbital tissue following inflammation. Lederer believes retrobulbar hæmorrhage with cicatricial degeneration of the orbital tissue is the cause. Himly assigns the cause to diminution of orbital fat as the result of atrophic lesion. Maklakow, Beer, and Schapringger hold it as due to an alteration in the fibres of the sympathetic, Schapringger stating that the enophthalmos is due to paralysis of the orbital muscle of Müller.

The writer agrees with Schapringger, but believes there is a

further causal element in the paralysis of the unstripped muscle fibres in the expansions of the capsule of Tenon, for if these expansions are cut enophthalmos results. He thinks the prognosis in true cases of enophthalmos should be considered favourable.

H. HORSMAN MCNABB.

BAUDRY (Lille). **Injuries to the Eye resulting from Accidents at Work.** *Archives d'Ophthalmologie*, August, 1905.

In this paper, which is now published separately also, Baudry points out the importance of simulation in injuries to the eye on account of the serious obstacle to work in these cases. Cases of simulation, exaggeration, or aggravation appear to have become more numerous in France since the passing of the Law of 1898. In England, according to Evans (Birmingham), simulation and exaggeration vary with the amount of indemnity accorded to the injured person.

Schmeichler (Austria) gives the proportion of these cases as 29%. Jacqueau (Lyons) records 80% as cases of exaggeration, and 4%—5% as pure simulation. Willot (Valenciennes) gives 75% as the average, and Schmidt-Rimpler (Germany) 80%—85%.

The writer had under his care 5,407 accidents at work from 1880 to 1898; and 1,742 from 1899 to 1905. In the former period he noticed simulation in 12% of the cases, whilst in the latter in 34%.

He gives notes of cases of simulation, exaggeration, etc., and draws the following conclusions:—The organ of vision is the site elect for simulation. The number of cases shows a steady increase in Austria, France, and England, whilst, according to Nieden, there is a gradual diminution in Germany. In those inventing a history of an accident or deceiving as to the origin of the eye trouble he finds various forms of conjunctivitis and hypopyon-keratitis, and advises that the injured person should have the benefit if there is any doubt as to accident in cases of hypopyon-keratitis.

In the case of a person stating that previous disease of eye is due to accident, those of hæmorrhage into anterior chamber, retina, vitreous and choroid, should only be looked

upon as due to this cause by process of exclusion. In detecting simulation of amaurosis, unilateral amblyopia, sympathetic irritation, and traumatic-hysteria, great stress is laid on the careful and minute examination of the pupil reactions, the direction of the visual axes, and the colour field of vision.

In amblyopia following an accident the whole field of vision instead of forming a cone with the apex at the anterior nodal point of the eye, is sometimes cylindrical in form, and Greef looks upon this as one of the diagnostic points in hysteria.

Baudry thinks that simulation should be punishable by law in England as it is in France and Germany.

H. HORSMAN McNABB.

ROHMER (Nancy). **Accidents to the Eye following Injections of Paraffin in the Nasal Region.** *Annales d'Oculistique*, September, 1905.

ATTENTION is drawn to the fact that in more distal parts of the body, when a portion of paraffin which has been injected into the tissues migrates, it passes through the right side of the heart and is finally arrested in the lung, where it gives little cause for anxiety; but, on the contrary, when the face, and especially the nose, is the site of the injection, the result of such a portion of detached paraffin passing along the blood-stream leads to much more serious consequences, as it is not unfrequently the direct cause of loss of vision, which is more or less complete and permanent. A typical case is described in detail, which, with notes of recorded cases from other sources, forms the basis of remarks.

Discussing the anatomical aspect of the question, Rohmer points out that there is an extensive subcutaneous venous plexus, which forms an anastomosis between the areas of the adjacent palpebral and orbital regions, and that the blood from it ultimately discharges into the ophthalmic vein on each side; the latter, in turn, leads away the blood returning from the eye-ball and all its adjunct structures. Further, it is stated that the arterioles in the region under discussion are not of sufficient calibre to admit the needle of an injecting syringe, but that, on the other hand, the lumen of canal in the venous plexus is often such as readily to allow

of this possibility: and, in the event of the needle entering a veinlet, the material would naturally tend to pass along the course of the blood-current which is in the direction of the inner angle of the eyelids, follow the large branch of the facial, and thence pass into the ophthalmic vein. The injected material solidifies after a certain interval and gives rise to serious obstruction, not alone in the portion of vessel where this occurs, but in those vessels leading into it also.

The view that these accidents following subcutaneous injection may be possibly the result of embolus in the central artery of the retina, is regarded as being quite untenable.

As to the methods to be observed when these cosmetic injections are made, emphasis is laid on the melting-point of the paraffin, which it is recommended should never exceed 105° to 108° Fahr., so that, solidification taking place in the tissues at once, a continuous mass is formed; also, each injection must be made with very gentle force; and, in the nasal region, it should be done in repeated small doses, never exceeding $1-1\frac{1}{2}$ c.c. each. In preference to other methods, it is suggested that the moulding and limitation of the material as it is injected should be accomplished by means of the fingers of assistants, which at the same time must exercise constant and firm pressure over each angular vein.

KENNETH SCOTT.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Vice-President, Dr. C. J. OLDHAM, in the Chair.

Meeting, 14th December, 1905.

I. CARD SPECIMENS.

A New Electric Perimeter.—Mr. Lindsay Johnson.

This perimeter belonged to a Priestley Smith type of instrument, with the following modifications:—

1. A readily adjustable chin rest.
2. A means by which the chart of any size can be readily adjusted on the register.
3. A simple means of raising or lowering the instrument to suit the patient.

The electrical attachment consists of a small portable fluid battery, sealed up to prevent spilling, and a small brass cylindrical box about $1\text{ m.} \times \frac{1}{2}\text{ m.}$ in diameter.

A small electric lamp is moved along the arm of the perimeter, and is so arranged that the rays of light entering the eye are parallel; this ensures greater accuracy in determining the field of vision.

Pemphigus of the Conjunctiva.—Mr. Malcolm L. Hepburn.

A.B., aged 47, was first under Mr. Spicer's care at the Royal London Ophthalmic Hospital, and later at St. Bartholomew's, where he was twice admitted for treatment.

He first came for advice on February 24th, 1904, complaining only of soreness at the inner part of right eye. At this time a small raised patch "like a mucous tubercle" was found covering an area of slightly congested ocular conjunctiva near the caruncle. Three months later a vesicle formed in this region, and soon after another on the upper and outer part of the conjunctiva near the corneal margin; three months afterwards a bulla appeared on the upper lid, and at the same time there was intense congestion of the whole of the conjunctiva of the right eye.

In spite of treatment, the condition progressed, another vesicle forming near the corneal margin on the opposite side, viz.: downwards and inwards, while the first vesicle had considerably extended, so that on July 6th, 1905, the sloughs had almost united and were invading the substance of the cornea. Although arsenic, mucin injections, and cauterization of the advancing sloughs were all tried in turn, the inflamed conjunctiva commenced to contract, so that there are now several bands of thickened conjunctival tissue passing from the lids to the eyeball, limiting especially the upward and downward movements, and rendering eversion of the upper lid impossible. There is no pain, and the vision is now only $\frac{6}{21}$. No satisfactory evidence of pemphigus elsewhere on the body.

Peculiar Appearance in the Vitreous.—Mr. Malcolm L. Hepburn.

B.W., aged 17, attended the London Hospital under Mr. Lister, requesting to have his eyes examined. He complained of nothing of any consequence. R.V. $\frac{6}{5}$ and J1. L.V. $\frac{6}{5}$ and J1. Fields full. In the left eye, during a routine examination, there was seen in the vitreous, about 1 disc diameter down and in, a circular haze in the anterior part, and in the centre of this appeared to be a small round hole. The condition was thought to be congenital, but the nature of it was uncertain.

Cilium in the Anterior Chamber.—Mr. G. Winfield Roll.

Ethel K., 24, an out-patient at the Royal Westminster Ophthalmic Hospital.

R. eye somewhat divergent; the lens shrunken and capsule opaque. There is a corneal cicatrix at the lower part, with an anterior synechia and some organised exudation in anterior chamber. The pupil is drawn downwards. There is an eyelash lying across the pupil and extending to the corneo-iridic angle of the anterior chamber. The other end is embedded in the remnant of lens. Nineteen years ago, the right eye was injured with a fork. L.V. $\frac{6}{6}$ and J1.

Case of Arterio-venous Aneurysm cured by Ligature of the Common Carotid Artery.—Mr. N. C. Ridley.

This patient was shown 2 years ago (*T.O.S.*, vol. xxiv., p. 190); and there was a recurrence of the pulsation $4\frac{1}{2}$ months after the operation. At the present time no pulsation can be felt, and apparently the clot felt 8 months after the operation increased and filled the sac, so effecting a cure.

Hyaline Degeneration of the Optic Disc.—Mr. N. Bishop Harman.

Patient was a man, G.C. R.V., H.M. + 2D = $\frac{6}{6}$. L.V., H.M. + 2D = $\frac{6}{6}$. One month ago patient discovered he could not see with the left eye. When seen with the ophthalmoscope, the left disc appears heaped up with hyaline material, with some smaller glistening spots at the macula.

Undeveloped Palpebral Fissures and Muscles producing extreme "Chinese Eye."—Mr. N. Bishop Harman.

This was the first child, aged 2 years and 3 months. Mr. Harman proposed to perform a plastic operation on both eyes for the improvement of this condition.

Notes and Drawings of a Severe Case of Vaccinal Conjunctivitis.—Mr. N. Bishop Harman.

Tubercle of the Iris.—Mr. J. Herbert Parsons.

Marjory R., aged 18 months, was admitted to Great Ormond Street Hospital for tubercular mastoid disease of left ear on May 8th, 1905, with a history of discharge since January, 1905. The grandfather and two aunts died of phthisis. Seven or eight weeks before admission a speck appeared on the left eye.

When seen by Mr. Parsons there was a yellowish red mass on the left iris down and slightly out, over which some vessels were running; it extended from the pupillary margin to the periphery. There was some iritis and lymph on the pupil. Under atropine the pupil dilated well except at the site of the tumour. No fundus details could be seen.

There was not much change in 5 months time, when the opsonic index for tubercle bacilli was found to be 1.5. Tuberculin was injected, and the tumour became smaller and the pupillary margin appeared. The opsonic index was 0.9. The following week another tuberculin injection was given, and at this time there was a slight relapse in the mastoid disease. The general health began to improve, and the mass steadily diminished. Fundus, which could now be seen, was normal.

Bullet Wound of the Orbit.—Mr. J. Herbert Parsons.

A.S., male, aged 16, was admitted October 19th, 1905, with a bullet wound of the right orbit. While he was looking down the barrel of a small revolver, it accidentally discharged, and the bullet entered through the middle of the upper lid. Both lids were swollen, no bullet could be felt though the probe passed backwards into the orbit for $1\frac{1}{2}$ inches; there was some powder on the cornea, and the vision was only perception of light. X-ray examination revealed the bullet at the level of the optic foramen.

After exploration under an anæsthetic, the bullet was found firmly imbedded in the bone; the wound was therefore closed and it healed up.

About 3 weeks afterwards there was some ptosis, but all the media were clear with the exception of some coarse vitreous opacities. Just above the disc is seen a small horizontal rupture of the choroid; and at the upper and inner temporal quadrant is a hæmorrhage which extends far forwards. There is also some slight diplopia. At the present time, ptosis and diplopia are gradually improving; the vitreous opacities are still present, and the hæmorrhage has cicatrized.

Such injuries are mostly the result of concussion; and the case ought to be watched, as remote meningitis is not impossible.

Extensive Non-pigmented Choroidal Change.—Mr. Charles Blair.

E.B., aged 30.

Scattered about each fundus are numerous, discrete, white, waxy-looking patches with well-defined edges, not raised, and entirely free from pigmentation. They are situated behind the retinal vessels, and are most marked in the right fundus and right macula. There is no evidence of optic neuritis or of vascular change. Other media are clear.

In some places the lardaceous material has become absorbed, and the choroidal vessels are clearly seen at the bottom of the patches. R.V. $\frac{6}{9}$, H.M. +0.5D = $\frac{6}{6}$ pt. L.V. $\frac{6}{18}$ C + 1 cyl ax 80° = $\frac{6}{9}$. No scotomata or limitation of fields. Urine normal.

Retinal Detachment with Unusual Appearance.—Mr. Charles Blair.

T. J., aged 29.

R. vision lost 12 years ago, from a blow while boxing. L.V. $\frac{6}{6}$, H.M. +0.5D and J1.

R.V. Barely counting of fingers. There is a detachment of the retina below; and the upper part of the fundus show many white lines branching in different directions behind the retinal vessels; the optic disc is pale and the macula atrophic. Media are quite clear.

Communications between Retinal and Choroidal Vessels in the Macula Region, giving the Appearance of a Second Disc.—Mr. Reginald E. Bickerton.

Right fundus shows choroidal sclerosis.

In the macula is a small central unabsorbed blood-clot surrounded by a pale area which is a cleared-up hæmorrhage; in this pale area is a large vessel just below the macula dividing into two branches, one going up and the other down. There is another small artery to its inner side, which appears to come from the central vessels but does not join this other large vessel. The upper branch of the larger vessel, after subdivision, communicates with the superior temporal artery. The lower branch joins with the descending branch of the superior temporal artery. There is an atrophic area round the disc.

This is a case of a man aged 73, suffering from defective sight for 3 or 4 years, which has gradually got worse. He was first seen in June, 1903. Then the R.V. was finger counting at 6 inches, L.V. $\frac{6}{24}$ and no possible improvement. Right pupil was sluggish to light, but normal consensually. A large hæmorrhage at the macula was seen, but none in any other part of the fundus; there was choroidal sclerosis from outside macula to the inner side of disc; and the retinal vessels were normal. No vitreous opacities were seen. The left fundus showed choroidal sclerosis, and granular pigmentation at macula, but no other change. Urine normal.

Two Cases Illustrating the Value of the Method of Treating Toxic Amblyopia with Large Draughts of Water.—Mr. C. Wray.

The first case was a man aged 76, who came under treatment on September 25th, 1905, and was treated by stopping tobacco and ad-

ministration of tonics. His vision was $\frac{6}{36}$, but after 6 weeks there was no improvement. He then came under Mr. Wray's care, who ordered him to drink four half pints of water a day, to be taken at 7, 11, 4 and 8 p.m., and to walk 10 to 15 minutes after each draught. He continued to take a tonic, and in three weeks he improved to $\frac{6}{12}$ (one or two letters).

The other case was one where the sight had begun to fail in January, 1905, and he smoked usually three ounces of tobacco a week. He gave up tobacco on May 10th, 1905, when his vision was as follows :—

R.V. $\frac{6}{60} + 3 = \frac{6}{24}$. L.V. $\frac{6}{60} + 3 = \frac{6}{24}$.

On October 4th, R.V. $\frac{6}{60} + 3 = \frac{6}{18}$. L.V. $\frac{6}{60} + 3 = \frac{6}{24}$.

On November 8th, R.V. $\frac{6}{60} + 3 = \frac{6}{18}$. L.V. $\frac{6}{60} + 3 = \frac{6}{24}$.

He then came under Mr. Wray's care, and commenced the hydro-therapeutic treatment, when his vision improved in one week to $\frac{6}{9}$ (one or two letters).

Case of Conjunctival Growth shown by Mr. E. J. Smyth at the last Meeting. Notes on the Pathology.—Mr. G. Coats.

Typical unpigmented mole, or so-called naevus. It is situated in the superficial layers of the conjunctiva over a considerable area of almost uniform thickness throughout. There are two types of cells :—

1. The naevus cells, small, round, oval, or irregular, with clearly stained nuclei in crowded masses.

2. Cells of epithelial type, containing larger nuclei and more protoplasm. They line the tubes and small cystic spaces containing granular debris; there are goblet cells here and in the epithelium.

Where the naevus cells are in contact with the epithelium, the latter is thinned. The blood-vessels are small.

II. PAPERS.

The Light Sense in Strabismus, especially in the Amblyopia of Strabismus.—Dr. D. Matheson Mackay.

In this paper, which was founded on observations made in 1903, at The Liverpool Eye and Ear Infirmary, Dr. Mackay set out to ascertain whether in cases of amblyopia the lesion is likely to be situated either in the choroid and retina, or in the retina and optic nerve.

With this point in view, he endeavoured to decide three points :—

1. Whether there is any difference in the light sense in an amblyopic eye as compared with the normal eye.

2. Whether there is any difference in the light sense in the squinting eye as compared with the normal eye.

3. Whether there is any difference in the light sense in eyes which are amblyopic, but where no squint has ever existed.

For the purpose of these experiments, any eye whose acuteness of vision could not be improved by correction beyond $\frac{6}{18}$, was considered amblyopic; and he invented for himself a photometer which enabled him (1) to determine both the light difference and the light minimum with the same instrument, (2) to have a constant source of light, (3) to test the light sense apart from form sense, (4) to work up directly from light minimum to light difference without any change in the method of examination, (5) to have an instrument involving no discomfort to the patient.

Investigations were carried out in 125 cases, and as a preliminary to the examination the patients were compelled to sit in a dark-room for 5 minutes in order to obviate all errors arising from the alterations in ordinary daylight. The two eyes were examined separately, and every observation was repeated, the second, if more favourable than the first, being recorded as the result.

He divided his cases into 6 divisions:—

1. Convergent Strabismus with amblyopia	...	...	...	...	...	...	66
2. Convergent Strabismus without amblyopia	...	...	...	...	...	...	30
3. Alternate Strabismus with double amblyopia	...	...	...	...	...	...	2
4. Divergent Strabismus with amblyopia	...	...	...	...	...	...	9
5. Divergent Strabismus without amblyopia	...	...	...	...	...	...	4
6. Amblyopia without Strabismus	...	...	...	...	...	...	14
							<hr/>
Total	...	...	...	...	...	...	125
							<hr/>

His results show that in 1, 2 and 6, which contain the largest number of the cases, the light minimum is normal in 86 per cent., 90 per cent., and 77 per cent., respectively; and the light difference is normal in 75 per cent., 80 per cent., and 77 per cent. respectively; and Dr. Mackay comes to the conclusion that the cause of squint or amblyopia, or both, cannot be found in any lesion of the optic disc, retina or choroid.

Krönlein's Operation for Tumours of the Orbit: Five Cases.—Mr. F. Richardson Cross.

Mr. Richardson Cross read a paper, describing his experience of Krönlein's operation in five of his own cases, and showed specimens of the orbital contents in each case. He brought forward a sixth case in which he thought the patient's condition might be materially improved, as well as a diagnosis be arrived at. He advocated this operation as a

method of procedure to be adopted more frequently for purposes of diagnosis, pointing out that very little damage is done to surrounding parts, and at the same time much valuable information may be gained. He also suggested it as a surgical measure to be employed in the treatment of exophthalmic goitre.

His first case was a man, aged 66, who came in November, 1904, to Dr. Every Clayton, complaining of severe neuralgia about the left sight of his face, especially around the left eyeball, accompanied by dimness of vision lasting 5 months. His vision was found to be $\frac{6}{18}$, but there was no other abnormal feature present; neither was any swelling felt in the orbit. No history to account for the condition. After one month of general treatment, the patient was seen by Mr. Richardson Cross, when the vision in the left eye was found to be $\frac{1}{60}$, with no improvement possible, pupils very inactive, and optic neuritis with much swelling of the papilla was seen ophthalmoscopically. The pain improved somewhat under general treatment, though the eye became blind, but 9 months later all the symptoms returned in an aggravated form.

Pain was increased by movement of the head, the mobility of the eye was impaired in all directions, and in addition to the optic neuritis, which was now very well marked, there were some hæmorrhages and swelling over the disc, suggesting neoplasm.

In this case Mr. Richardson Cross advised Krönlein's operation as an exploratory measure.

He next referred to a case published last year in the *T.O.S.*, where he removed a cystic fibro-adenoma by this method; and where the subsequent progress of the case was not altogether satisfactory owing to the permanent damaging of the external rectus muscle, although the vision in the eye was practically perfect.

The second case was that of a man, aged 29, who first came for treatment on February 16th, 1905, with a history of "puffiness round left eye" for 12 months, and prominence of eyeball for 8 months. A hard, nodular mass was felt on the nasal side of the eyeball, passing backwards into the orbit, and pushing forwards the upper eyelid. Nothing abnormal noted in the vision or ophthalmoscopically.

The tumour, the size of a pigeon's egg, which was probably a sarcoma or lymphadenoma, was removed through an incision along the upper margin of the orbit. There was persistent mydriasis following the operation; and when seen on November 16th, 1905, the eyeball was immovable owing to its being bound down with fibrous tissue. Vision $\frac{6}{12}$. Fields contracted. Optic nerve normal.

The third case was that of a woman aged 65, who first came for advice

on April 6th, 1905, with a history of prominence of the right eye of 2 years' duration, but varying at different times; the eye was red and sometimes painful.

The vision was found to be finger counting at 18 inches with full fields; nothing else abnormal beyond some pallor of the disc.

The tumour, which was removed by Krönlein's operation, was found partially encapsuled, but so closely adherent to the eyeball and surrounding structures, that it was necessary to evacuate the contents of the orbit. The nature of the tumour was not definitely decided.

The next case was that of a woman aged 32, who first came for treatment on July 29th, 1905, complaining of a growth on the outer side of left eyeball, which had been growing for 1 year, and more rapidly the last 6 months. A soft, semi-solid growth was felt beneath the external rectus muscle, passing backwards into the orbit, and caused some proptosis. V. $\frac{6}{9}$ and J1. Some optic neuritis was seen with ophthalmoscope. The tumour, which was probably a sarcoma, was removed by Krönlein's method, and found so closely attached to the external rectus that only the anterior portion of the muscle could be saved. There was some inflammatory reaction for a few days after the operation, which ultimately quieted down.

The next case was one of hydatid cyst of the orbit occurring in a man aged 21, who came for advice on February 16th, 1905. For 2 months the sight had been dim in the left eye, and was getting worse; for one month the eyeball had been prominent. Nothing could be felt, but the conjunctival veins were enlarged on the outer side; movements were slightly limited in outward direction, the left pupil was larger than the right, and acted sluggishly, and there was occasional diplopia. Vision was $\frac{6}{12}$ and J8, with narrowing of fields, and some optic neuritis.

Krönlein's operation was performed, and the tumour carefully dissected away from the external rectus and optic nerve. There was a little delay in the union of the bone, and some slight impairment of movement, but the vision was $\frac{6}{12}$ and J1, and the optic neuritis cleared up in a few months.

The last case was that of a man aged 29, who first attended on September 6th, 1905, with a history of having had slight prominence of his right eye for 9 years; for 6 years it had become more marked; and for 2 years this projection had been getting much worse. A general swelling, most noticeable in the lachrymal fossa, and involving the bony walls of the orbit, was found pushing the eyeball forward and causing some chemosis. No impairment of movement; vision was $\frac{6}{5}$ and J1. X-ray examination showed nothing.

After 2 months of general treatment with iodide of potassium and mercury, Krönlein's operation was performed, when the growth, which was an osteo-sarcoma, was found to have involved so much of the bony wall of the orbit that it had to be scraped away piecemeal. The wound healed well, and 12 days after the operation there only remained some crossed diplopia.

On Cyclops.—Mr. M. S. Mayou.

Mr. Mayou began his paper by stating that the first cases described were those of Schön and Pannum in two children, one of whom lived 6 weeks and the other 18 months.

He proceeded to show photographs of sections taken from 4 specimens which had come under his own notice. One of them was a case of cyclops in a dog, and the other three human, one of which was a twin whose faces had united anteriorly so that there was a face on each side, each containing a single eye made up by the fusion of two eyes, one from each foetus. This latter is probably unique. The sections demonstrated the following points. In the brains examined there was no indication of any convolutions or fissures, and in one case the posterior half of the cerebral hemispheres had been converted into a large cyst through distension of the cavity of the first cerebral vesicle during its development, thus bearing out the theory of the formation of cyclops given by Dareste, viz. :—a maldevelopment of the anterior neural tube during foetal life. The basal ganglia were not properly formed, but appeared fused together. Fusion between the two optic vesicles takes place along the ventral surface of the embryo, and therefore the union must occur before the optic vesicles are budded off, since they are budded off laterally in the normal process of development.

The optic nerve is usually single, and seems to be continuous behind with a process of brain matter at the base of the brain apparently representing the optic thalamus; and in only one case (that of the dog) was there any indication of optic tracts. The single bony orbit is bounded above by the frontal bone, on each side by the malar bone, which also forms the anterior part of the floor, the posterior part being formed by the palatal process of the superior maxilla; the posterior part of the cavity is shut off from the mouth by the junction of the palatal process of the palate bone with the anterior part of the body of the sphenoid. There is absence of the ethmoid, turbinated, vomer, nasal process of the palate, nasal process of the superior maxilla, and the inter-maxillary or nasal bones.

The optic foramen is single and of different shapes and sizes.

The lachrymal duct is absent, and there are no upper canaliculi. There are usually two lower canaliculi, but in two cases (that of the dog and one of the human specimens) they were absent, and in another (also a human case) there were four. The caruncle is single and situated in the middle line at the angle formed by the junction of the two lower lids.

The ocular muscles are imperfectly separated from one another.

The only external evidence of fusion of the globes is the shape of the single eyeball which is longer in its horizontal than in its vertical axis in all cases. In the interior of the eyeball, there is more indication of the fusion of two eyes: as in one case (a human cyclops) there are two lenses, while in others two retinae, as represented by the inner wall of the secondary optic vesicle, are in contact along the line of junction, though the pigmentary layer is continuous and single. There are also two irides in some cases, and in one case two corneae side by side. There is generally one optic disc, but often two persistent hyaloids.

Nearly every degree of fusion is found, the eyes are generally microphthalmic, and there is more separation shown anteriorly than posteriorly.

The proboscis, formed by the union of the frontal nasal processes above the combined eye, contains bone, cartilaginous canal and pigmented cells, and is lined by ciliated epithelium. There are generally two olfactory nerves passing through a single foramen, but there may be two openings, and in one case the nerve and opening were absent altogether.

In another case there was no sign of a proboscis at all: an extremely rare condition.

MALCOLM L. HEPBURN.

ERRATUM.

We regret that on p. 16 the measurements of microscopic organs were, by accident, given in "m" in place of " μ ."

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AN IMPROVED METHOD OF MOUNTING EYE SPECIMENS IN FORMALIN SOLUTION.

By PRIESTLEY SMITH, F.R.C.S.

A FIVE per cent. solution of formalin has certain advantages over glycerin jelly for the mounting of ophthalmic specimens: it is more transparent and absolutely colourless; it keeps the specimen in a condition suitable for section-cutting at any future time; it is prepared without difficulty. In the *Ophthalmic Review* of January, 1897, I described and figured a method of formalin-mounting in a specially-made jar in which the specimen is held in contact with the glass by means of a glass rod passed through the rubber bung which closes the jar. Experience has shown that such preparations, excellent at first, are generally marred before long by the entrance of air. Of late years I have discarded this method in favour of a better.

The vessel employed (see figure) is a square, upright, stoppered bottle, the neck of which is as wide as the body. The divided eye is placed upright against one side of the bottle and is held in position, not by cementing it to the glass as in the method adopted by Greef,* but by a back-ground of thick, white drawing-paper, in which is cut a round or oval hole to receive the back of the half-eye, the space behind the paper being packed with small bits of absorbent cotton-wool to keep the whole in place. The bottle is filled up to the shoulder with the solution, and is tall enough for any air remaining in it, or entering subsequently, to be well away from the specimen even when the bottle is held in a sloping position. The height gives room also for a label above the specimen. Specimens mounted in this way and placed on shelves near the level of the eye are seen very conveniently.

* Anleitung zur mikroskopischen Untersuchung des Auges, 1898.

The bottles, for which a special mould has been made, are polished, so as to save unnecessary expense, on one side only. They can be obtained from Mr. T. Chase, Five Ways, Broad Street, Birmingham. The paper from which the background is cut should be Whatman's thickest drawing-paper—the thickest made. Cardboard should not be used, as it separates into layers. The hole is readily cut with a carpenter's gouge.

To mount a specimen, lay the bottle flat, polished side downwards, and place the half-eye in it in the desired position; lay the paper upon the specimen and pack the space at the back with sufficient cotton-wool to fix it in position; fill up with fluid and then add as much more wool as may be required. Adjust the position of the eye with forceps or a strabismus hook. Liberate any air imprisoned between the specimen and the glass by passing the point of a Graefe knife between the two. Smear the stopper with vaseline to reduce evaporation to a minimum, and if the preparation is to be handed about place an elastic band round the bottle to keep the stopper in place. The other half of the eye may be conveniently preserved in the wool at the back of the same bottle.



Half actual size.

BACTERIOLOGICAL EXAMINATION OF TWENTY-FIVE CASES OF SERPENT ULCER OF THE CORNEA WITH HYPOPYON, AND REMARKS ON TREATMENT.*

By H. HORSMAN McNABB, M.D., Ch.B. (Viet.), *Honorary Assistant Surgeon, Royal Eye Hospital, Manchester.*

IN the examination of these cases there has been no attempt made at an exhaustive investigation of the total bacteriology of the conjunctival sac.

The method adopted in each case was as follows:—

The lachrymal sac was gently irrigated with sterile water, the lower lid everted, and the conjunctiva gently stroked with a loop of sterilized platinum wire in the fornix as far away from the lachrymal duct as possible. The loop of fluid thus obtained was stroked on tubes of serum and agar. A scraping of the ulcer was obtained by means of a sterilized platinum loop and stroked on tubes of serum and agar. All tubes were incubated at a temperature of 38°C. Subcultures of the organisms found were made on agar and film preparations were prepared from these.

To study further the biological characters of the organisms, stab-cultures were made in gelatine and, when deemed necessary, tubes of peptone-bouillon and milk were inoculated, and drop-cultures, plate cultures and growth on potato were made. The films taken from the cultures were stained with carbol-fuchsin and by Gram's method in

* Extracted from a thesis presented to the Victoria University, Manchester.

every instance, and occasionally with methylene-blue or methyl violet. Coverglass films were made direct from the conjunctiva and from the ulcer in every case.

In six cases the pus from the anterior chamber of the eye was inoculated on tubes of serum and agar, all necessary steps being taken to prevent contamination.

In one case the micro-organism ceased to grow and was not definitely recognised. In the primary cultures the organism showed the characters of the pneumococcus. Film preparations show an oval coccus arranged as a diplococcus.

In two of the cases no growth was obtained from the ulcer.

BIOLOGICAL CHARACTERS OF UNRECOGNISED MICRO-ORGANISMS:

Morphology. A coccus about the size of staphylococcus pyogenes aureus. Frequently in pairs, and when so the adjacent margins are flattened.

Serum. Opaque white, slightly raised, circular colony with glistening surface.

Agar. Small, opaque white colony with cream-coloured centre.

Gelatine. Stab-culture. Small, circular, opaque white growth on the surface of the medium, slight growth in depth of the medium. No liquefaction. Plate culture, circular, discrete, opaque white colonies, later becoming cream coloured.

Broth. Fine white deposit at the bottom of the tube and at the sides of the tube. Alkaline reaction.

Motility. Non-motile.

Staining reactions. Stains well with aniline dyes. Is not decolorised by Gram's method.

Organism.	Ulcer.	Conjunctiva.
Fraenkel's pneumococcus	16 times	... 11 times
Bacillus xerosis	9 „	... 13 „
Staphylococcus pyogenes albus...	3 „	... 4 „
Staphylococcus pyogenes aureus..	2 „	... 3 „
Streptococcus pyogenes longus ...	- „	... 1 „
Diplococcus ? nature	1 „	... 1 „
No growth	2 „	... - „

The cultures of pneumococcus obtained all grew well on agar, on the surface of which they had a marked tendency to spread, the progressing margin of the growth being slightly whiter and not so translucent as the rest of the growth. In many cases it was noted that the viability of the pneumococcus as grown from the ulcer was greater than the pneumococcus as grown from the conjunctiva.

The bacillus xerosis in many specimens showed irregular staining, and was frequently stained bi-polarly, so that it appeared very much like a diplococcus.

The organism named staphylococcus epidermis albus showed the characters of the staphylococcus pyogenes albus, but gelatine was liquefied, and milk coagulated much more slowly by it than by the staphylococcus pyogenes albus.

The coverglass films taken in each case from the ulcer and from the conjunctiva showed only epithelial cells, leucocytes, and granular debris. In none of the films could it be said that any definite organism occurred in the leucocytes or in the epithelial cells after most careful examination.

In six cases the pus from the anterior chamber was inoculated on serum and agar, and in no case was there any growth obtained.

The foregoing bacteriological findings agree with those of other observers that in the majority of cases of serpent

ulcer of the cornea the pneumococcus of Fraenkel is the infecting organism.

The multitude of methods is evidence of the unsatisfactory basis of treatment in these cases. In my opinion no one method of treatment is applicable to all cases. Some do perfectly well with simple antiseptic treatment providing the hygiene of the lachrymal sac is attended to, others require more active treatment such as cauterization of the ulcer or inferior section of the cornea. Personally I adopt an antiseptic treatment (perchloride of mercury solution 1:5000 and ointment of iodoform) and slit up the lachrymal canal in every case, injecting with a pipette a few drops of 25% solution of argyrol into the lachrymal sac daily. This is usually combined with atropin and hot bathing of the eye. This treatment is, as a rule, efficacious in the majority of cases. If the ulcer shows marked tendency to spread the thermo-cautery is applied, and if the hypopyon increases in spite of other treatment an inferior section at the periphery of the cornea is performed. Whenever possible open-air treatment of the case is adopted. The subconjunctival injection of antiseptic solutions such as cyanide or perchloride of mercury or sublamin has not in my hands proved satisfactory, any good result being attributable to an increased leucocytosis and not to any germicidal action, an end which can be equally well attained by the injection of normal saline or the application of a stimulating ointment.

As to the relative value of a mydriatic or myotic in hypopyon ulcers, no definite rule can be laid down, but I agree with Herbert in finding that most pleasing results occur by the continued use of atropine despite the presence of increase in tension in cases where there is secondary irido-cyclitis.

REVIEWS.

ALEXANDER DUANE (New York). **Paralysis of Divergence.**
Ophthalmology, October, 1905.

THIS is a condition characterised, Duane thinks, by the following signs:—

1. Sudden development of homonymous diplopia with convergent squint, with or without vertigo, false projection, and apparent movement of objects. The diplopia is marked and confusing for distance, but is absent in reading or sewing. If the diplopia is slight it can usually be obviated by tipping the head forward so as to direct the eyes slightly up. These subjective symptoms are less pronounced than they are in a true muscular paralysis.

2. The diplopia and convergent squint, measured in degrees, decrease with almost mathematical regularity as the object looked at is brought toward the patient; until at a certain definite distance (usually a few inches) from him, there is binocular single vision. Contrary to what might be supposed the convergence near-point is often rather remote in uncomplicated cases.

3. In almost all cases, but particularly if there is much complicating convergence-excess when the object of vision has been brought so close that it is seen single (single vision by approximation), the patient can then still hold the images together (*a*) when prisms, base in, of several degrees strength are placed before the eyes, or (*b*) when the object is slowly carried off again some considerable distance (single vision by recession).

4. The homonymous diplopia and the convergent squint do not increase—in fact, they usually diminish somewhat—as the eyes are carried to the right and to the left. Diplopia and deviation diminish somewhat in looking up, increase in looking down.

5. The excursions of the eyes are normal in all directions. Only after the condition has lasted for some time, a slight restriction of outward movement can be observed, especially in the squinting eye.

6. The conditions found are often strikingly stable. The deviation and diplopia may increase at first until a certain

maximum is reached, then usually remain the same for months or even years.

Closely allied to divergence paralysis, and indeed merging into it, is the condition known as divergence-paresis or divergence-insufficiency.

The condition present in this and similar cases is distinguished from a bilateral paralysis of the externi or from a contracture of the interni by two cardinal facts. First, there is no limitation of outward nor excess of inward movement in either eye. Second, the diplopia does not increase (in typical and especially in well marked cases it usually diminishes) as the eyes are carried to the right or to the left.

From a spasm of convergence, the condition is differentiated, first by its usually stable character, and by the fact that the deviation diminishes progressively as the object of fixation is carried toward the eyes.

The only satisfactory explanation of the condition is that it is due to a paralysis of divergence.

Divergence-paralysis may be complicated by a paralysis or spasm of one of the vertical muscles, or an association-paralysis of up or down movement, or a paralysis of convergence.

Correction of the refraction is of help mainly when a primary or secondary convergence-excess is present and aggravates the condition. In a true divergence-paralysis lenses are of little use, and may even aggravate the symptoms by enhancing the distinctness of the double images and so rendering it harder for the patient to ignore them.

Prisms, base out, have been used with advantage; they are of little service only when the deviation is slight. If there is much complicating convergence-excess, prisms may tend to make the deviation progressively worse.

In some cases tenotomy of the interni has proved efficacious. It would seem particularly indicated when the element of secondary convergence-excess is prominently present. Otherwise advancement of the externi would appear more rational. In any case an operation would be contra-indicated unless one could feel sure that the process was stationary.

E. J.

J. MELLER (Vienna). Sclerosis of the Cornea. *Klinische Monatsblätter für Augenheilkunde*, September, 1905.

DISCUSSING cases of progressive diffuse opacity of the cornea, arising otherwise than from ulceration, Meller describes as sclerosis progressive whitening of the cornea in eyes previously blind from other causes. Two cases are detailed, investigated microscopically, and commented upon.

Case 1. A patient, blind for years with a loose lens free to pass from vitreous to anterior chamber and conversely, was operated upon with a view to removing this irritating body; the lens could not be secured and vitreous escaped. The wound healed, though there were attacks of pain and keratitis bullosa. The cornea regained a healthy glistening surface; but a progressive whitening of the cornea ensued, and this, with the painful symptoms, determined the removal of the eye. Histologically, the opacity was found to be due to a growth of dense connective tissue between the corneal epithelium and Bowman's membrane. The epithelium was altered by some loss of basal cells. Bowman's membrane was defective in parts, and the new connective tissue penetrated the spaces in it to reach the proper substance of the cornea. At the operation scar Descemet's membrane was separated widely, and the gap was filled by a mass of new tissue which overlaid the membrane before and behind for a considerable part of its circumference; this plug carried vessels and was lined posteriorly by endothelium. There were no signs of cyclitis, but the iris and ciliary body, and also the optic papilla, were atrophic. Meller considered this form of progressive opacity or sclerosis of the cornea to be due to loss of sensibility in the damaged eye allowing repeated slight surface injuries to produce a progressive degenerative pannus.

Case 2. An old man was operated upon for traumatic cataract produced by an iron splinter 18 years previously. The lens fell back into the vitreous; it was removed with the double hook with loss of vitreous. Later the eye became totally blind from retinal detachment, and subsequently a progressive whitening of the cornea occurred, and that apart from the marked scar of the operation wound. The surface epithelium was normal. The opacity, on high magnification, could be seen to be slightly patchy. T—2. The eye was

removed. Sections showed that Descemet's membrane was considerably detached from its bed and its epithelium disintegrated. It was in part embedded in a fibrinous exudate sparsely sprinkled with round cells and pigment granules. About the iris and ciliary body were patches of similar exudate, and the stump of the iridectomy wound was attached to the cornea. Beneath the rumpled Descemet's membrane the proper substance of the cornea was swollen, its cells could not be stained, and the fibrillar matrix was loosened so that its striations were more marked than usual. This case Meller considered to illustrate a second order in the production of progressive sclerosis or whitening of the cornea, by the permeation of the proper substance of the cornea with aqueous humor subsequent to damage to Descemet's membrane.

N. BISHOP HARMAN.

A. BIELSCHOWSKY (Leipzig). **Hausmann's Stereoscopic Pictures and the use of them.** *v. Graefe's Archiv*, 61, 3.

HAUSMANN'S stereoscopic pictures are designed to demonstrate rapidly and accurately the presence or absence of binocular vision. They are also intended to exercise and strengthen the required movements in abnormal muscular equilibrium, either alone, or after surgical treatment. There is nothing essentially new in the employment of stereoscopic pictures for such purposes, but Hausmann's have certain distinct advantages. They are composed of only circles and straight lines, and represent very simple objects which even the stupidest patient could describe. The usual stereoscopic pictures and photographs when looked at with one eye show, of course, the differences in depth that ordinary pictures suggest. It is often difficult to make out from the patient's answers whether he sees binocularly or not. In Hausmann's pictures, on the other hand, if fusion occurs, well marked differences in depth are easily seen, of which there is no indication whatever when the pictures are viewed separately. Moreover, by transposing the pictures right and left, the effect is reversed. Thus a door can be made to appear opened either to or from the observer. In this way the answers of a patient who already knows the pictures can be checked and the examination made

more interesting. There is a black dot at the top of one picture and a similar one beneath the other. If only one is visible we know the patient is using only one eye, and the position of the dot tells us which.

The pictures are placed in sliding carriers, which, by the rotation of a screw, can be made gradually to approach or to recede from one another. Vertical displacement can also be produced. Their cost is not high, a matter of considerable importance, as it not infrequently happens that the very patient who could obtain good from such an apparatus is unable to purchase it.

From our experience these pictures form a very rapid and accurate test as to the presence or absence of binocular vision. They are also useful in those cases where the patient can see two images but rarely fuses them. The distance should be first adjusted, so that the two images are superimposed. A difference in depth, of which there was no previous indication, is suddenly perceived and shows that fusion has occurred. The distance is then gradually increased or diminished to suit the defect until the images fall asunder. The process is then repeated *de novo*.

But what if the patient cannot see two images, or if he can, that fusion will not occur? You can bring a horse to the water, but you cannot make him drink. Hausmann's pictures in such cases (and they are, unfortunately, very numerous) are of no more use than any other stereoscopic contrivances.

Possibly Worth's idea of reducing the illumination of the image the patient sees, might be an aid in using Hausmann's pictures, and the suppressed image by becoming relatively more bright might, as it were, force itself upon the patient's attention. Although in the majority of cosmetically cured squints, binocular vision cannot be obtained, still every such patient should get the chance afforded by stereoscopic exercises. The time taken up in finding out whether a patient has a trace of the binocular faculty, and the uncertainty of the result, lead most of us to abandon the attempt in all but the most promising cases. Anything that makes this examination quicker and more certain is to be welcomed, and Hausmann's pictures are calculated to have this effect.

P. W. MAXWELL.

T. H. MILROY. **The Response of the Developing Retina to Light and Radium Emanations.** *Journal of Physiology*, xxxiii., 1.

THE normal retina, after rest, responds to light by the protrusion of pigment-holding processes, and by the contraction of the rods, and also possibly by the cones. Milroy experimented on the developing chick to determine if possible the earliest period at which these responses could be obtained. A number of hens' eggs were incubated in the dark, and others in an incubator where light could be condensed upon them throughout the whole period of their incubation. Embryos were removed from the shell in a dark room and the eyes exposed to a bright light and fixed in corrosive sublimate solution; the eyes of the control embryo were fixed without exposure. It was found that although retinal pigment was present as early as the fourth day, the resting and stimulated retinae were identical until the fifteenth day, that is to say, until the rods and cones had been formed. After the seventeenth day the pigment cells send out protrusions even when light is condensed merely upon the shell, and the embryo then removed and fixed in the dark. There is no delay in development in embryos incubated in the light.

A further series of experiments was made to show the effect on development of the presence of radium during the incubation period.

Schwarz has already shown that after exposure of a hen's egg to radium a marked browning of the shell membrane was produced and also a decomposition of lecithin, with a formation of trimethylamine. In all Milroy's cases the discolouration was found, and in many the odour of trimethylamine was noticed. The microscopical appearances of the eye at the seventh day showed the same general appearance as one developed under ordinary conditions, but there was marked degeneration, especially of the retina. The lens was fluorescent. After the fifteenth day the following appearances were noted:—

1. The pigment layer was well marked but irregularly distributed.
2. The rod and cone elements were less distinct than usual.

3. The external nuclear layer was composed of large and vesicular nuclei; the protoplasmic strands were broken into small fragments.

4. The external and internal layers were more granular than normal.

5. The internal nuclear layer showed advanced degeneration.

6. The ganglion cells were vacuolated and in many cases shrunken and collapsed; their processes could be traced only for a short distance.

7. The nerve fibre layer was degenerated and showed a large amount of granular debris in the strands.

When one considers how slight are the visual sensations from radium exposure, and that these sensations are due largely to fluorescence of the lens, one is driven to the conclusion that these marked disintegrating effects on the retina are possibly the β , but even more likely the γ rays.

The degeneration is peculiar in that mitosis is not inhibited, and the retina develops in the usual way.

These experiments of Professor Milroy's are of much interest as it is possible that radium may cause retinal degeneration in the human eye. It is advisable that some form of protection for the eye should be adopted when prolonged exposure to radium emanations is necessary.

E. W. BREWERTON.

JEAN GALEZOWSKI (Paris). **Toxic Amblyopia caused by Copper.** *Recueil d'Ophthalmologie*, October, 1905.

METALLIC copper is not toxic by itself, but this does not hold good in relation to its salts. There has been a tendency to exaggerate the ills which have resulted in persons who have swallowed copper coins, or in workers who have respired or absorbed copper dust. Boucharlat has said that lead has caused more harm than fear, and copper more fear than harm; yet, although the accidents due to copper are not very frequent, nevertheless they exist. A copper colic analogous to that produced by lead is described, and Bally mentions a copper line on the teeth and borders of the gums analogous to the line of Burton; it is chiefly limited to the incisors and

canines, and give to these teeth a blue-green colouration: this deposit disappears after brushing the teeth.

Galezowski has not been able to find in the literature on the subject an example of toxic amblyopia due to chronic copper intoxication. He relates a case which he recently has observed in which copper appears to be the sole toxic agent which has produced the amblyopia; it occurred in a man of 57, who for seven years had complained of a fogging of vision, which during the last two years had remained nearly stationary. The visual acuteness of the right eye was $\frac{1}{10}$, and that only in excentric fixation; there was not an absolute scotoma either for white or colours. In the left eye there was an absolute central scotoma for white and colours; it extended 10° to the upper, lower, and outer sides of the fixation point, and 15° to the inner side. The ophthalmoscope only revealed a very slight pallor of the temporal side of the left disc. The pupils reacted sluggishly to light.

On questioning the patient, he related that several years previously he had suffered from violent pains in the stomach. On examining his hands, the palms were found to be impregnated with a blackish-green metallic-looking substance; the two upper incisors were covered with a greenish substance, and the other incisors and canines also, but in a slight degree. The patient stated that he was a labourer, but that since he was twelve years of age he had played a brass instrument nightly in a band generally from nine in the evening to three or four in the morning. He absorbed thus a considerable quantity of copper, both by the hands, which were continually rubbing against his instrument, and which he did not always wash before eating, and by the lips, which were so constantly in contact with the mouthpiece of the instrument, from which the silver-plating had long since worn off. The patient was most temperate both in regard to alcohol and tobacco, and there was nothing to suggest as a cause except the copper intoxication.

It must, therefore, be admitted that copper can produce accidents by intoxication: it has, moreover, the same influence on the optic nerve as alcohol, tobacco, di-sulphide of carbon, or lead.

E. M. LITHGOW.

M. MEYERHOF (Cairo). **Acute Purulent Conjunctivitis in Egypt.** *Klinische Monatsblätter für Augenheilkunde*, September, 1905.

MEYERHOF describes his experiences of 300 cases seen in Upper and Lower Egypt in the years 1903—5, and investigated bacteriologically. After a general summary of previous work of this nature, a description of his methods of work, and of the class of patients dealt with, he sets out his results.

In the 300 cases he obtained as presumptive causal organisms—Koch-Weeks bacillus, 157 times; gonococcus, 80 times; Morax-Axenfeld bacillus, 37 times; pneumococcus, 10 times; streptococcus pyogenes, 4 times; Klebs-Loeffler bacillus, 2; influenza bacillus (? Müller's bacillus), 2 times; Friedlaender's bacillus, 1 time; Organisms without pathological significance, 7 times. Besides these he frequently obtained the xerosis bacillus, staphylococci, and sarcinæ.

On the relation of the season of the year to epidemics he makes some interesting observations which he tabulates thus:—

Season.	Koch-Weeks Bacillus.	Gono- coccus.	Other Organisms.	Corneal Complica- tions.
April to July.....	43	13	6	9
Aug. to Nov.	32	37	17	38

Commenting on the characters of the disease produced by the organisms, he remarks of Koch-Weeks' catarrh, that it is rare for a family of children of European or native race to escape an attack in summer. He notes the liability of this catarrh, in the absence of efficient treatment, to pass into a chronic form.

On gonorrhœal ophthalmia he notes that although in the 80 cases he found the Neisser's coccus without exception, yet he never found the organism in the new born, and he finds that ophthalmia of the new born is rare in the lying-in hospital, although Crédé's method is not practised. He states that the native women appear to take no special care of their infants' eyes, save that frequently onion juice is instilled or a scale of an onion is applied as a pad to the eyes. He remarks on the great tenacity of the organism for affected tissues, and the ease with which it is demonstrated in apparently old cases of trachoma.

On pneumococcal affections he remarks the rarity of *ulcus serpens*, his cases only numbering six.

Of severe necrosis of the conjunctiva he found two cases caused by the Klebs-Loeffler bacillus, and four by the streptococcus pyogenes; all were severe "croupous cases," and in one of the latter group an eye was lost from panophthalmitis.

Of pseudo-membranous cases he had 37, and in these he found—Koch-Weeks bacillus, 19 times; gonococcus, 11 times; Klebs-Loeffler bacillus, 2 times; streptococci, 2 times; nil, 1 time.

He instances some striking cases of mixed infection. In a case of trachoma in an old woman he found the gonococcus, Koch-Weeks bacillus, the pneumococcus, yellow staphylococci, and the xerosis bacillus. In a case of trachoma in a girl of four years old, he found, in April, 1904, Koch-Weeks bacillus, in May the gonococcus, in early July Koch-Weeks bacillus with the pneumococcus; at the end of the same month there occurred a severe exacerbation of gonorrhoeal ophthalmia, and in the following September an attack from Koch-Weeks bacillus.

In conclusion, he states that there are three things necessary for Egypt:—

1. To combat the destructive superstitions prevalent, the wide-spread quackery, and the indolence of the natives.

2. To educate the natives in cleanliness, and the provision of a greater and more general water supply.

3. To increase greatly the number of well-trained doctors in trachoma and primary glaucoma; for, despite the excellent work done by means of the movable eye hospitals of Sir Ernest Cassel, there is no present possibility of meeting effectively the pandemics of the summer season in this the thickest populated country of the earth.

It is said by an old practitioner that there has been a decline in frequency and severity of ophthalmia epidemics in Egypt in the last two decades. If this be true, it is due to the good influence of the British régime, the increasing prosperity and cleanliness of the natives, and their growing confidence in European doctors. But this is not enough. The State does nothing directly, and there is still a thick wall of oriental indolence, superstition, and dirt not thrown down; and much water will flow through the Nile before Egypt ceases to merit the name—"The Land of the Blind."

N. BISHOP HARMAN.

A. POULARD (Paris). **Staphylococcic Infection of the Conjunctiva.** *Archives d'Ophthalmologie*, October, 1905.

POULARD agrees with most of those who have worked at the bacteriology of the conjunctiva in not assigning to staphylococci a prominent place amongst the pathogenic organisms found in conjunctival diseases. They are found no doubt in many conjunctival affections, but in no larger quantities than in the healthy conjunctiva. He refers to the frequency with which staphylococci are found in cases of phlyctenular conjunctivitis, but attaches no etiological importance to their presence, being of opinion that the ulcers or erosions following the phlyctens, and the accompanying blepharitis, are merely conditions favouring the growth of staphylococci. The object of the author's article is to bring before his readers a form of conjunctivitis which he would consider as being due to staphylococci.

The material from which he evolves this type consists of nine cases observed by him at the Hotel Dieu in a period of two and a half years.

The chief features of the conjunctivitis are:—

1. It attacks one eye which is, or has recently been, affected with a blepharitis or a sty.
2. A yellow, muco-purulent secretion which covers the conjunctiva, forming a fine pellicle, and which is easily detached.
3. On account of the moderate swelling of the conjunctiva and lower lid, there is always difficulty in opening the eye.
4. The pre-auricular gland is swollen and tender.
5. The case runs a slow course—20 to 30 days. The disease bears no similarity to any other specific forms of conjunctiva, except, perhaps, a very mild attack of diphtheria of the conjunctiva.

Considering how frequently one meets with styes and various forms of blepharitis and the almost constant presence of staphylococci, Poulard is at a loss to account for the rarity of the type which he wishes to establish as a clinical entity.

H. C. MOONEY.

E. FUCHS (Vienna). **Small Ruptures at the Corneo-scleral Margin.** *Wiener Klinische Wochenschrift*, 1905, 38.

RUPTURE of the eyeball is a not infrequent result from a severe blow on the eye by means of a blunt instrument. It may be direct and occur at the point of contact, or, more frequently, indirect, when the rupture will be at some distance from this point.

The direct ruptures are chiefly corneal and vary much in position and shape, the deeper tissues of the globe are always involved; the iris prolapsed with or without vitreous, and the lens capsule often injured.

The indirect ruptures appear usually at a distance of 2—5 mm. from the corneal margin, and most often in the upper part. The wound originates about the position of the canal of Schlemm, so that its course through the sclera is somewhat oblique. The wound is 10—12 mm. in length, crescentic, with its concavity towards the cornea, and is covered usually by unruptured conjunctiva.

Professor Fuchs describes the mechanics of the condition, and comes to the obvious conclusion that the rupture is due to a bursting of the eye at its weakest spot from a sudden increase of pressure within the globe. He then describes a special small rupture at the corneal margin, 17 cases of which he has collected in the last seven years. This form of rupture is only 2—4 mm. in width; the conjunctiva is invariably torn for the reason that at this position it is so closely united to the subjacent tissues. The opening is concentric, as is scleral rupture, and is also usually above. The iris is commonly prolapsed, and in 6 of the cases the zonule of Zinn was torn and vitreous appeared in the wound.

The marginal rupture occurs at a younger age than scleral rupture—5 in the third decade, 6 older, and 6 younger; one of the last was in a child aged $2\frac{1}{2}$ years. The treatment requires a free iridectomy and careful reposition of the iris, otherwise serious defect of vision will result.

Professor Fuchs is unable to explain why in some cases a typical scleral rupture results from a blow and in others a marginal rupture. The upward position, he thinks, is probably due to the instinctive upward movement of the eyes when a blow is expected, the weakest and least supported part of the eye under those conditions being the upper corneal margin.

E. W. BREWERTON.

ADOLPH GUTMANN. **The Etiology and Statistics of Primary Iritis.** *Deutsche Medizinische Wochenschrift*, 1905, 42.

WAGNER, in 1891, found that in the Würzburg Eye Hospital, during the previous five years, 50% of the cases of primary iritis were due to tubercle, and a very much lower percentage to syphilis. In 1898 Haas, working in the same hospital, confirmed this. In 1900 von Michel collected 84 cases, and was the first to point out the connection between chronic nephritis and primary iritis, and also that disease of the circulatory system bore some definite relation to primary iritis. He found tubercle as a cause in 36·8%, and syphilis in 5%. Schwarz, in criticising von Michel, remarked that in Leipzig syphilis and rheumatism together far outweighed the total of all the other cases.

Gutmann, after remarking on geographical position and social conditions as factors, publishes 150 cases of primary iritis taken from the University Eye Clinic in Berlin; these he classifies in nine groups:—

Group I. consists of one case in which the investigation of the eye by itself was sufficient to determine that the iritis was due to tubercle. This case showed tuberculous disease of the sclera as well as plastic iritis. (In the Würzburg statistics, in the absence of any other discovered cause, the cases were all included as tuberculous.)

Group II. 40 cases of iritis. These patients were suffering from probable or certain tuberculous disease elsewhere, such as enlarged lymphatic glands, etc.; other possible causes were excluded.

Group III. consists of 8 cases in which chronic nephritis was well marked, with no evidence of syphilis, tubercle, or other disease.

Group IV. 20 cases, with definite circulatory disturbance, chiefly arterio-sclerosis and cardiac hypertrophy.

Group V. 47 cases of syphilitic iritis.

Group VI. consists of 5 cases in which gonorrhœa had caused a general infection. Four of these followed gonorrhœal rheumatism. Gonorrhœal toxin may remain latent for a long period without symptoms. One patient developed iritis two years subsequent to gonorrhœal rheumatism.

Group VII. 5 cases of rheumatic iritis, three of which were associated with polyarthrititis.

Group VIII. Mixed infection. Disease of the lungs with arterio-sclerosis, also syphilis associated with tubercle.

Group IX. 2 cases of iritis (bilateral), in which the only disease discovered was chlorosis.

In the above cases tuberculous disease was present in 27%; chronic Bright's disease in 5·3%; circulatory disturbance in 13·3%; syphilis (hereditary and acquired) in 31·3%; gonorrhœa and joint rheumatism in 3·3%; other diseases in 4%; unclassified in 12%.

Many surgeons in this country consider the commonest cause of serous iritis, especially in men, to be gonorrhœal toxin. In Gutmann's figures only one case of gonorrhœal iritis without, and four with, gonorrhœal rheumatism are recorded. The explanation, possibly, may be found in the greater prevalence of venereal diseases generally in this country. The percentage of tubercle as a cause, in Wagner's classification, is ridiculously high, and even in Gutmann's (27%) is much higher than is found in England.

E. W. BREWERTON.

DUPUY-DUTEMPS. **Atrophy of the Iris, Associated with Tabes and General Paralysis.** *Annales d'Oculistique*, September, 1905.

THIS special form of atrophy of the iris is said to be a previously undescribed symptom, to be noticed in cases of tabes dorsalis when the Argyll-Robertson sign is present. It is constituted by a marked general atrophy and thinning of the iris, accompanied by effacement of the reticulated surface which is so evident under normal conditions. This wasting of the iris is, however, not found to be so extreme as that which may be encountered in cases of old inflammation of the organ and there is also a difference in degree and appearance from that flattening of the surface met with in advanced age and in high myopia; but in glaucoma an almost exactly similar change is to be found. It is not an unusual feature of this special form of atrophy in cases of paralysis to be present only in a partial condition, affecting simply certain sectors of the iris, but at the same time it never occurs in the form of concentric zones. There is often also an irregular outline of

the pupil aperture seen accompanying this atrophic condition, which corresponds to and is influenced by the pre-existence of the atrophy when the latter is confined merely to sectors of the iris. It has also been noted that in these cases, whilst the association between contraction of the pupil and closure of the palpebral aperture, described by Galassi and others, is sometimes regular and uniform, the accommodative movement is irregular and even segmentary.

In the only case in which a histological examination of the implicated part has so far been possible, a general atrophy of stroma tissue was present without any trace of inflammatory changes, and at certain points there was large accumulation of irregular masses of pigment, abnormal in appearance.

The author reviews at some length and in considerable detail the various theories and results of observation, obtained by different workers, on the changes in innervation associated with structural alteration or destruction of the iris and ciliary bodies; and in conclusion he ascribes the condition which he has described, and its variations in degree and form, to the extent to which the ciliary nerves, both long and short, are implicated.

KENNETH SCOTT.

VACHER AND BAILLART. **The Influence of Full Correction of Myopia on its Progression and on Detachment of the Retina.** *Annales d'Oculistique*, November, 1905.

It being now generally admitted that full correction is the ideal treatment of myopia, such papers as this is, which gives the results of such treatment in the principal directions in which evil effects were feared, are of value. For the purposes of this paper the authors divide myopes into two groups. The first of these includes the healthy young myope, who without any lesions of the posterior part of the eye possesses a full range of accommodation. The second group consists of those older patients in whom there is a lessened power of accommodation with atrophy of the circular ciliary muscle, and in addition possibly lesions of the fundus. In the first group it is not the use of the accommodation that is to be dreaded, but the excessive convergence. This is best avoided by full correction; at the same time great stress is laid on the necessity for a proper working attitude. In the second class of

case full correction will not be tolerated at once, but should be worked up to, use being made of unocular accommodation exercises. The authors formulate the following rule: "Correct the total myopia in all cases in which it is less in dioptries than the age of the patient in years. If the contrary is the case, endeavour to arrive at full correction gradually."

The authors declare that it is inadvisable to order glasses for children under seven, as the parents will not allow it, and the child runs a risk of injury from breaking the glasses. This is contrary to our experience in England, where we are in the habit of ordering glasses at any age, if necessary, and have no trouble from injury or from parents.

The paper concludes with an account of all the non-traumatic cases of detachment of the retina in the clinic of one of the authors for the last ten years. These number 55. In only one of these was the myopia fully corrected. The authors state that, in their opinion, full correction of the myopia will, in the future, be found to have a prophylactic effect on detachments.

E. ERSKINE HENDERSON.

STOEWER (Witten). **The Diplo-bacillus Ulcer of the Cornea.**

Klinische Monatsblätter für Augenheilkunde, August, 1905.

To judge from recent publications this form of corneal ulceration is either becoming more common or, what is more probable, its occurrence is attracting more attention. Stoewer cites no fewer than 32 cases of this form of ulceration observed by him during the last three years, these cases forming 34% of the total number of infective corneal ulcers. Stoewer judged the ulceration to be due to the diplo-bacillus when this organism, alone, or in combination with some harmless saprophyte, was found in cover-glass preparations, or in cultures made from the ulcerated area. Cases in which the pneumococcus was found along with the diplo-bacillus were not included. Stoewer notes that in film preparations the bacilli sometimes appeared extremely small, though in culture they showed themselves to be ordinary diplo-bacilli. With regard to the clinical characters of the ulceration, Stoewer's descriptions agree in the main with those of recent writers. In three cases he noted the presence of small separate infil-

trations near the ulcer. The diagnosis between this type of ulcer and that due to the pneumococcus seems to be most certainly made, especially in the earlier stages of the ulcer, by bacteriological methods. Inspection of a cover-glass preparation generally suffices to settle the matter.

In none of Stoewer's cases was dacryocystitis present, and in 81% there was a distinct history of injury; this circumstance, no doubt, accounts for the more frequent occurrence of the ulceration in male patients. The disease for the most part runs a milder course than the typical *ulcus serpens*. Most of the cases yielded to treatment with zinc sulphate, and in cases where treatment with zinc failed, Stoewer found the cautery thoroughly effective in checking the spread of the ulcer.

J. V. PATERSON.

AXENFELD (Freiburg). **Isolated Dehiscences of Descemet's Membrane.** *Klinische Monatsblätter für Augenheilkunde*, August, 1905.

THE presence of tears in the membrane of Descemet in cases of hydrophthalmos congenitus has recently been pointed out by Reis. Haab had previously noted the presence of peculiar stripes on the back of the cornea in this condition and ascribed the appearance to rupture of Descemet's membrane. Axenfeld found recently in a case of megalocornea very early changes in Descemet's membrane analogous to those seen in hydrophthalmic eyes. The case was that of a young man whose left eye since early youth appeared larger than the right, the diameter of the left cornea being 14 mm. as against 11.5 mm. in the right eye. The cornea was quite clear, as were also the lens and vitreous; the fundus was normal, and the vision good. With the plane mirror a transparent wavy line appeared running obliquely downwards and outwards across the pupillary area. Movement of the mirror showed two bright lines about 1 mm. apart enclosing a bright stripe between them. In the lower outer part of the cornea this stripe was joined by a second stripe, which crossed the cornea at a lower level. When the eye was directed upwards several less distinct, nearly concentric lines became visible. As the corneal surface was absolutely smooth and the ophthalmometer showed no irregular astigmatism, these lines must have had their origin

on the posterior surface of the cornea. By oblique illumination a faint indication of their presence could be made out. With a corneal microscope it was found that the edge of the bright stripe was joined by a slight ridge with a double contour and a faint grey border on the side adjoining the normal cornea. The bright stripe between the ridges represents the seat of the tear. Although no glaucomatous symptoms were present in this eye still Axenfeld would look upon the case as one of cured hydrophthalmos.

In a second part of his paper Axenfeld discusses the question of acute exacerbation of keratoconus from spontaneous rupture of Descemet's membrane, and cites a recent case:—A young man who had for years suffered from keratoconus in both eyes developed suddenly acute changes in the left eye. The eye became infected and irritable, the apex of the cone intensely opaque, hard, and resistant to pressure, though there was no increase of intraocular tension. Under treatment the opacity diminished and the signs of irritation gradually disappeared. A year later Axenfeld had an opportunity of examining the eye with a corneal microscope. The apex of the cone was faintly opaque, but by careful focussing it was possible to make out in the posterior surface of the cornea a fine line enclosing a small oval central area. This appearance Axenfeld considers to be due to an old rupture of Descemet's membrane, this rupture having been the cause of the acute symptoms previously observed. In the right eye appearances were similar, and there was a history of a similar acute attack some years before.

Axenfeld does not consider that these ruptures of Descemet's membrane have anything to do with the onset of keratoconus. In early cases he has found no trace of such an appearance. In advanced cases the membrane seems occasionally to give way, causing acute symptoms as in this patient. In a short time the endothelium spreads over the gap and the symptoms abate. Axenfeld does not attribute the faint opacity of the apex of the cone so often seen in keratoconus to ruptures of Descemet's membrane, but rather to gradual changes in the corneal tissue itself. A careful examination of cases of keratoconus with a corneal microscope should throw light on the question of whether changes in Descemet's membrane are frequent in this disease.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Meeting, 25th January, 1906.

The President, Mr. PRIESTLEY SMITH, in the Chair.

CARD SPECIMENS.

A Case of Subconjunctival Cysticercus.—Messrs. A. Stanford Morton and G. Coats.

THIS was the case of a man, aged 33, who came to the Royal London Ophthalmic Hospital complaining of a swelling on the inner side of the left eye, which had been noticed for two years. Beneath the left caruncle was found a flattened cystoid swelling which became more marked on the patient looking to the left. There was no sign of inflammation and the tumour felt tense, appearing to fluctuate; the conjunctiva moved freely over it, but beneath it seemed attached to the scleral tissue. There was no pain, the vision was $\frac{6}{6}$, and the fundus normal. The man had been in the army for 10 years, and had served in India and South Africa. On two occasions recently he had had convulsive attacks of an epileptoid nature.

The tumour was easily removed though it was found adherent to the Internal Rectus Muscle. The growth, when examined microscopically, was found to be a necrotic *cysticercus cellulosa*, surrounded by its fibrous capsule, measuring 7 mm. by 3.5 mm. The hooklets were 28 in number, arranged in two concentric circles.

Subconjunctival cysticercus is a very rare condition, the commonest situation being in the vitreous.

New Growth in the Choroid.—Mr. R. E. Bickerton.

This was the case of a man, aged 80, who complained that six months ago he began to notice dimness of vision in the left eye. Ophthalmoscopically a large hæmorrhage was seen downwards and towards the temporal side. During the process of absorption, and before details could be ascertained, a second hæmorrhage occurred which is still unabsorbed. One month ago a dotted appearance began to show itself round what was the limit of the blood-clot, which increased in size, and subsequently a detachment of the retina took place in the neighbourhood and is now gradually increasing. The tension, normal until a fortnight ago, is now fuller than in the right. There is no history of injury.

The case was thought to be one of neoplasm of the choroid.

Anophthalmos in the Right Eye with Microphthalmos of the Left.—
Mr. R. E. Bickerton.

AN infant, one month old, had never been able to open the lids of the right eye since birth. The upper lid was raised with difficulty, when a long funnel-shaped hole was revealed, lined by conjunctiva, but no vestige of an eye could be seen, though it is possible this may be obscured by some inflammation of the conjunctiva now present.

The left eye was microphthalmic with an eccentric pupil down and in, almost constituting a coloboma.

Orbital Tumour with Extension to the Temporal Fossa.—Mr. L. V. Cargill.

THIS was the case of a woman, aged 32, a widow, who came over to this country from Natal in order to obtain advice respecting the condition of her left eye, which she said had been prominent for three years. This prominence has been gradually getting worse, and for the last two years had shown itself also on the left side of the head. A photograph of the patient taken four years ago showed proptosis of the left eyeball. At the present time the eyeball is pushed forwards, downwards and outwards, the movements are normal, and there is no nystagmus. Vision is $\frac{6}{6}$ and J1. The field shows *very* slight contraction, and there is no neuritis or fulness of the veins.

An ill-defined, painless, immovable swelling is felt under the supra-orbital margin, most marked on the outer side, and extending into the temporal fossa, pushing in front of it the temporal muscle; it has an elastic sensation, but there is no fluctuation or pulsation. A radiograph shows no osseous abnormality nor any unusual shadow.

The tumour was thought to be a slow growing sarcoma involving the bone forming the outer part of the roof of the orbital cavity.

PAPERS.

The Treatment of Detachment of the Retina.—Dr. A. Maitland Ramsay.

This paper was based on the systematic treatment of all cases of detached retina (amounting in all to 50) coming under observation at the Glasgow Ophthalmic Institution during the four years preceding October 31st, 1905. The line of treatment carried out in all cases was as follows:—

1. Rest in bed.
2. Both eyes closed with a pressure bandage.

3. On the 2nd or 3rd day a subconjunctival injection was given of 5 to 20 minims of a 1 in 2,000 solution of bicyanide of mercury with an 8 per cent. solution of sodium chloride. Whenever this did not produce œdema of the conjunctiva, which Dr. Ramsey considers an essential point, the injected fluid was supplemented by a 10 per cent. solution of dionine. The injection was repeated as often as necessary, the intervals usually being from 4 to 6 days.

4. Where practicable the subretinal fluid was evacuated by scleral puncture.

5. Particular attention was given to the general health of the patient as well as ensuring a proper action of the skin and bowels; Dr. Ramsay believing that only in the careful attention to every detail, however apparently trivial, can satisfactory results be hoped for.

If no improvement occurred in ten days or a fortnight a subcutaneous injection of pilocarpine ($\frac{1}{8}$ gr.— $\frac{1}{4}$ gr.) was administered, alternating with the subconjunctival injection.

The whole treatment generally lasted a month, but if no improvement occurred in three weeks, further efforts were considered useless.

Dr. Ramsay discussed the *modus operandi* of the subconjunctival injections, and quoted Dr. Karl Wessely's investigations as proving the process to be entirely that of an irritant producing vascular reaction.

It was also found that the ultimate prognosis was more influenced by the pathological antecedents of the affected eyes than by the actual duration of the existing condition; and that failure was the rule in all cases of seriously degenerated choroid, a red-coloured detachment, and a much diminished tension.

The analyses of the fifty cases treated by this method shows that 27, or more than one-half, received no benefit whatever. Of the remaining 23, 10 showed decided improvement; five of these eventually relapsed, but only after periods of two weeks, two years, two years, two years, and four years respectively, and there is reason to believe that in the other five the benefit derived from the treatment is still maintained.

We may, therefore, summarize Dr. Ramsay's results as 20 per cent. definite improvements, and 10 per cent. permanent improvements.

I. *A Case of Thrombosis of the Cavernous Sinus.*—Mr. Simeon Snell.

This was the case of a young medical practitioner who was first seen on May 11th, 1905.

Ten days previously he had pricked a vesicle on his upper lip with a scarf pin which had become contaminated with some discharge from an

abscess in the finger. In the course of the next few days swelling and œdema starting in the lip at the site of the injury had extended over the whole of the left side of the face and up into the orbit, spreading subsequently to the right side of the face and right orbit. Repeated incisions on both sides of the face failed to arrest the inflammatory extension. Seven days after the commencement of the illness an effusion appeared in the right side of his chest extending up to the angle of the scapula.

Proptosis of the right eye was well marked on May 10th, which was followed in 24 hours by prominence of the left; there was much chemosis attended by so much swelling of the lids that they were unable to close properly over the eyeball, thus exposing the cornea. There was no perception of light in the right eye, and the movements of the eyeball were lost; the ophthalmoscopic examination showed some optic neuritis. The temperature ran a septic course throughout the illness, and the general condition indicated rapidly increasing collapse.

The patient's condition precluded an extensive operation under a general anæsthetic; so that, under ethyl chloride, the orbit was explored first through the outer angle and then through the inner, but without result. The next day some paralysis of the right facial nerve and some slight deafness on the same side developed, and the case ended fatally on May 14th, 1905.

II. *Acute Œdema of the Eyelids*.—Mr. Simeon Snell.

Mr. Snell described the case of a man, aged 48, a pork butcher, who had come under his care on December 20th, 1905, suffering from acute œdema of both eyelids involving the conjunctiva.

The patient had been dressing a pig the previous day, and while he was squeezing out the intestines, which always contains worms, some of the contents splashed up into his eyes. By 6 p.m. the same evening he had acute swelling of both lids with some herpetic vesicles on the external surface; the conjunctiva was much chemosed but both corneæ were clear.

The contents of the bowel were strongly acid, and the species of worm usually inhabiting the intestines of a pig is the *Ascaris Snillæ*, allied to the *ascaris lumbricoides*. It occurred to Mr. Snell that the œdema might be due to some parasitic action set up by this worm, and with this object in view experimental investigations were carried out on the conjunctiva of a guinea-pig, but with negative results.

All the œdema disappeared in three days under perfectly simple treatment.

A Case of Bitemporal Hemianopsia.—Dr. D. J. Wood.

Dr. Wood described the case of a man, aged 33, who came under his care on September 19th, 1904. He had suffered from severe headaches for over a year with occasional attacks of vomiting, having no relation to food, and for nearly 12 months the sight in his right eye had been failing. Three months ago his legs became weak and he was gradually losing his memory. He had a dull absent manner, constantly repeating the same words over and over again, and frequently losing himself in the midst of a conversation owing to lapse of memory.

R.V. with $-4D = \frac{6}{60}$. L.V. with $-15 \text{ sph.} = \frac{1}{60}$. No fundus changes were seen, but the outer half of both fields was lost, which loss in the case of the right eye included the macular region; what remained of the field was much contracted in both eyes. No hemianopic pupil reaction was noticed, but the movements were sluggish.

Medical examination revealed nothing abnormal, and a radiograph showed an ill-defined area of increased opacity in the region of the sella turcica. For over 3 weeks he was treated with iodide and bromide of potassium; but during this time he got steadily worse both mentally and physically, so that he no longer answered questions, was delirious, had delusions at night, and ultimately became dirty in his habits.

An unfavourable prognosis was given, and his friends removed him from the Hospital. Dr. Wood heard no more of him until he came to report himself nine months later. He stated that one morning he had suddenly become perfectly conscious and proceeded to ask rational questions as to where he was, and how he got there; at the same time the power in his arms and legs quickly returned and he made an un-interrupted recovery.

Dr. Wood was of opinion that the case was to be explained on the assumption that a cyst had formed in the neighbourhood of the pituitary body which suddenly burst, thus giving rise to the unexpected recovery; yet there was no evidence of discharge into any of the surrounding cavities.

R.V., no P.L.

L. V. $\frac{-15 \text{ sph}}{-1.5 \text{ cyl Ax, Hor.}} = \frac{6}{18}$

There was still absence of the temporal half of the left field.

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A NEW EXPERIENCE IN THE DIAGNOSIS OF SARCOMA OF THE CHOROID IN THE SECOND STAGE.

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THE following case of sarcoma of the choroid, in which the diagnosis was complicated by the presence of cataract, is brought forward in the hope that the writer's experience may be of service in similar cases.

Mary H., aged 56 years, was first seen at the Eye Infirmary, Charlotte Street, Glasgow, in the middle of January, 1905, complaining of dimness of vision of the right eye. The vision was found to amount to perception of light only with the right, and to $\frac{6}{18}$ with the left eye. The eyes looked normal externally; both pupils reacted freely to light. Ophthalmoscopic examination showed the presence of cataract in a moderately advanced stage in the right eye and the existence of hypermetropic astigmatism and beginning cataract in the left. The patient was sent away to wait until the right eye was ready for operation. Four months later she was seen again and the cataract was found to be much more advanced but not yet ripe. On the 13th of June she returned, saying that for the last three days she had been having great pain in the right eye. A condition of sub-acute glaucoma was found, the tension being very high. The pupil contracted under eserin readily, but the tension was not reduced to any extent. Continued use of eserin for a week was ordered as the patient would not submit to operation, and as the state was not in the least improved by this, operation was again urged and consented to. On the 21st of June a large iridectomy upwards was made, and just before the dressings were adjusted it occurred to the writer to feel if the tension

of the globe was much reduced. He was surprised to find that there was practically no diminution of tension, and the conclusion was come to that the true condition was an intraocular tumour. It was then decided that, if the tension was not reduced in the course of a week, the eye should be excised. No reduction being found, though the iridectomy was in all ways a satisfactory one, the eye was removed on the 28th of June. When the globe was opened a small melanotic sarcoma was found growing from the neighbourhood of the optic nerve entrance. The most important point in the case however, was the fact that the retina was found to be very completely separated and very tightly pressed forwards against the lens and ciliary body.

The explanation of the non-reduction of the tension in this case is as follows. The anterior chamber was very shallow owing to the lens being pressed forwards by the retina, and the entire globe was probably to a very slight extent distended. When the anterior chamber was opened and the few drops of aqueous which it contained were evacuated, the tension of the tunics of the eye was relaxed and they then contracted upon what was to all intents and purposes a separate cyst in the interior of the globe. This separate cyst was formed by the sclerotic behind and at the sides, but was bounded in front by the retina supported by the lens and ciliary body in such a manner that no rupture took place when the corneal wound was made. It is not improbable that, had a large incision been made in the cornea, the retina would not have been sufficiently well supported and a rupture would have taken place.

Now, it is, of course, clear that the mere fact that the tension was not reduced by the opening of the anterior chamber does not indicate that there is a tumour of the choroid, but that the retina was separated, and it is only

the association of increased tension with separated retina that in such a case would indicate that the separation was not a simple one.

The tension of the globe is always reduced by the opening of the anterior chamber in cases of pure glaucoma, and the second or glaucomatous stage of choroidal sarcoma is practically always the result of separation of the retina. If, then, a case is seen in which there is not satisfactory reduction of tension after opening the anterior chamber in a glaucomatous eye it is probable that the condition is intraocular tumour.

ON THE PATHOLOGY OF CHORIO-VAGINAL (POSTERIOR VORTEX) VEINS.

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THE occurrence in highly myopic eyes of large venous trunks, which closely resemble vortex veins, but disappear in the neighbourhood of the disc, has only recently aroused the attention of ophthalmologists. They were pictured, though not described, by Liebreich in his Atlas, and again by Czermak, who spoke of them as "abnormal vortex veins." The first clear recognition and account of them, however, is due to Schoute (1898). Referring to this paper in Nagel's Jahresbericht of the same year, Axenfeld expressed the opinion that, although previously undescribed, they were not of very infrequent occurrence. In 1903 Schoute was able to refer to 13 cases of his own, and 2 by van der Hoeve. Pictures of the condition will be found in the atlases of Oeller and Haab; that given by Oeller is the most typical.

In all these cases, except one of Schoute's, the eyes were

myopic, and in some the myopia was certainly progressive; in the exception there was slight hypermetropia. Thomson and Ballantyne have reported two other cases in hypermetropes, together with a case in a myope. They state that they have "each seen several cases in which a larger or smaller number of veins in one or both eyes converged towards the sheaths of the optic nerves."

From personal experience I should say that they are uncommon, but not extremely rare if one watches specially for them. But they are easily overlooked or wrongly interpreted. They occur as large, sometimes enormous, vessels, without lustre or reflex, lying behind the retinal vessels. In Oeller's case the largest of them measured half the diameter of the disc. They collect blood from a ramified system of broad trunks, often extending over a large area of the fundus, very much in the same manner as a vortex vein; so that the term "posterior vortex vein" is clinically very apt. The large trunk formed by the junction of these ramifications disappears at or near the edge of the disc, or within a myopic crescent, or at its outer edge. They are not confined to one or other side of the disc, but are probably seen most frequently downwards and outwards. That they are veins and not arteries has been proved, if proof were necessary, by observing that on applying pressure to the globe the central end empties while the branches remain normally filled, or possibly become fuller and darker.

The condition is not to be confounded with mere visibility of the choroidal vessels due to thinning and atrophy of the choroid. In normal circumstances the choroidal blood even from the neighbourhood of the papilla is collected by the equatorial vortex veins, the minute branches which enter the nerve from the choroid being

too small to be visible ophthalmoscopically. The course of the blood towards the disc, and the disappearance of these huge trunks at its edge constitute something quite abnormal and very striking when attention has been called to it. Moreover they are only seen with great rarity in poorly pigmented emmetropic or hypermetropic, or in albinotic fundi. So large and dull coloured are they that in many cases they have been mistaken for hæmorrhages. In the first case reported by Schoute the vein had been seen 13 years before, but had been recorded in the notes as an extravasation of blood.

Up to the present practically nothing has been done from the pathological standpoint to elucidate these appearances. There is no exact knowledge as to what becomes of the veins after their disappearance, and into what vessels their blood is poured. Moreover there have been few suggestions as to why they should occur, and why they should be so frequently found in highly myopic eyes. It has been supposed that they are simply congenital abnormalities. The vortex veins are notoriously inconstant in number and position, and it has been suggested that in the cases under consideration one is merely abnormally inserted in the neighbourhood of the nerve. But this does not take account of their frequency in high myopia, and is not a probable explanation of cases in which there are several such veins (five in a case of Haab's, and in two of Thomson and Ballantyne's cases). It receives a certain amount of support, however, from a case reported by Axenfeld and Yamashita, in which a large vessel, resembling in form and size a vortex vein, pierced the sclerotic from the choroid close to the nerve on the temporal side. This had not been seen ophthalmoscopically, and occurred in an emmetropic eye. It was discovered

accidentally in the microscopical preparation. In commenting upon this Axenfeld and Yamashita raise the question whether such veins may not occur as a congenital abnormality with equal frequency in hypermetropic, emmetropic, and myopic eyes, but only become visible in highly myopic eyes in consequence of choroidal thinning. But here again the explanation is improbable where there are several veins, and it does not take account of the frequency with which they disappear at, or very close to, the edge of the disc.*

A step in advance was taken by van Geuns, who pointed out that the vessels concerned are probably the same as those which give rise to the rare condition known as "optico-ciliary veins," *i.e.*, the occurrence on the disc of a large branch of the central vein which disappears at its edge into the choroid (as has been proved anatomically by Elschmig). van Geuns, following Elschmig, believes that such veins represent a congenital enlargement of the normal minute anastomoses between the choroidal and central vessel on the nerve head, and suggests that chorio-vaginal veins differ from them only in degree. Optico-ciliary veins disappear on reaching the periphery of the disc because they are hidden in their further course by the retinal pigment; chorio-vaginal veins, which are visible in the fundus in myopic eyes on account of the choroidal thinning, disappear on reaching the disc because they lie deeper in the nerve than the visible optico-ciliary veins. The connection between the two is furnished by a case of

* Through the kindness of Prof. Axenfeld I have been able to examine pictures of this case. The vein in question appears to leave the choroid about the macular region, and to reach the external surface of the sclera two disc-diameters from the papilla. This would be an unusual distance for a chorio-vaginal vein.

Elschnig's where the optic-ciliary vessel was visible for some little distance beyond the edge of the disc in consequence of poor pigmentation of the fundus, and presented a certain resemblance to a chorio-vaginal vein.

The following accidental discovery in a highly myopic globe appears to throw some light at least on the question where these vessels go after their disappearance. It seems also to offer strong evidence in favour of a slightly modified version of van Geun's theory of enlarged anastomoses. I venture to offer some suggestions as to the causation of such an enlargement, and to discuss whether—as van Geun supposes—it is always a congenital abnormality. I omit all pathological details which do not immediately concern the subject in hand.

A man, aged 51, had his right eye enucleated on account of a severe plastic iridocyclitis following upon extraction of cataract. As the lens was cataractous when he was first seen, no estimation of the refraction or ophthalmoscopic examination had been possible. The left eye had 4D of myopia: the disc was normal with a very narrow temporal crescent, and there were no chorio-vaginal veins. The right globe showed in an extreme degree the anatomical peculiarities of the myopic eye. It measured $33\frac{1}{2}$ m.m. longitudinally, 29 m.m. transversely, and 25 m.m. vertically, *i.e.*, it was greatly elongated and expanded laterally. The degree of myopia may be roughly estimated at 27D. The bulging of the globe was chiefly at the temporal side of the nerve, where the sclera was so greatly thinned as to appear bluish from the underlying uvea. In addition there was a separate localised bulging involving the region of the nerve entrance, so that the whole papilla was at the bottom of a pit with steep edges on the temporal side, but more shelving on the nasal. The fundus was poorly

pigmented, and there was a large ring of choroidal atrophy around the disc.

The eye was embedded and cut in the usual manner, and the sections were mounted in a series with irregular intervals in order to study some changes in the macula. The optic nerve entrance showed the most extreme degree of myopic distortion. It was displaced not only backwards, but also upwards, so that the nerve was very obliquely inserted, proceeding from below upwards and then turning suddenly forwards to pass through the lamina cribrosa. It thus happened, most conveniently for the present purpose, that with the same direction of section longitudinal sections of the nerve entrance, and, lower down, transverse sections of the nerve were obtained. At a considerable distance from the disc on the temporal side the retina became fused with the choroid into an indistinguishable layer of dense fibrous tissue with a few small isolated patches of pigment among it. The pigment epithelium ceased as a distinguishable layer with the ending of the retina proper. On the nasal side the retina was preserved, though somewhat degenerated as far as the papilla. The choroid was also more or less distinguishable up to the same spot, but greatly atrophied and in places without a covering of pigment epithelium.

The lamina cribrosa was much condensed, but it was simply displaced backwards along with the neighbouring structures of the nerve entrance. There was no true glaucomatous cupping. A notable and important point was the great increase in the area of the nerve entrance as judged by the position of insertion of the dural sheath into the sclerotic. This increase was caused only slightly by the extension in a lateral direction of the lamina cribrosa and other tissues of the papilla; it was chiefly due

FIG. 1.

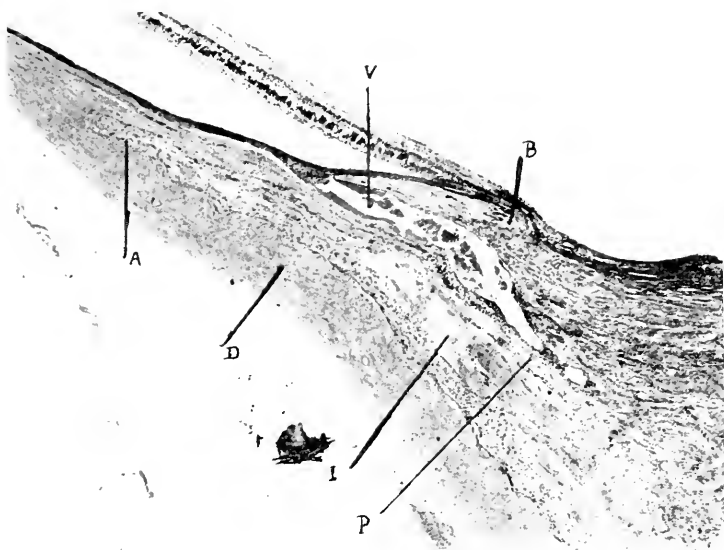
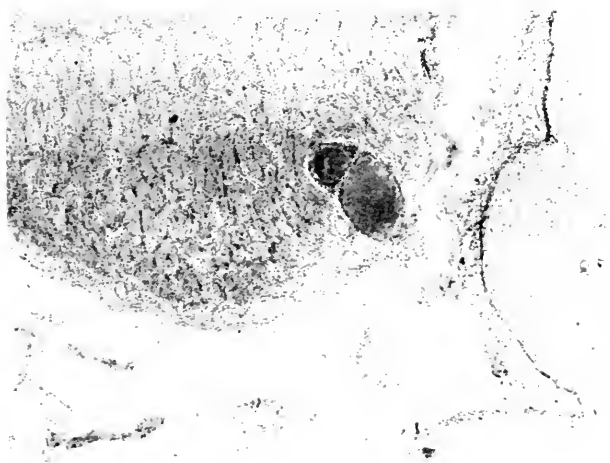


FIG. 2.



to an enormous elongation of the scleral promontory, *i.e.*, that terminal portion of the sclerotic from which the lamina cribrosa springs, and which lies just in front of the anterior end of the inter-vaginal space. In the stretching which the posterior part of the globe had undergone the nerve and dural sheath had been separated (as usually happens) on the temporal side and rather brought together on the nasal.

It was on the nasal side that the abnormal vein was found in the present instance, and its relations can best be followed by studying Fig. 1. (A) shows the point where the dural sheath of the nerve (D) joins the sclerotic. It therefore marks the anterior end of the inter-vaginal space (I), and may be taken as a useful landmark from which to orient. (B) is the point from which the lamina cribrosa springs, and shows also the place where the choroid and retina end. The wide area between (A) and (B) therefore corresponds to the very small area in the normal eye, which lies over the anterior end of the inter-vaginal space and within that point. This shows the great elongation which the scleral promontory, and with it the choroid and retina, have undergone. (P) is the pial sheath of the nerve which is also inserted into the ending of the sclera. (V) is an extremely large vessel which emerges from the choroid within the elongated area, and piercing the tissues of the scleral promontory obliquely near its end runs up the nerve *close to and within the pial sheath*. The vessel is a typical vein with a well-marked endothelial lining, but no muscular fibres in its wall. It is filled with blood. Following it farther up the nerve it makes one or two sharp tortuous bends, but remains always close under the pial sheath. It is certainly much larger than the central vein, and is probably even larger than would

appear from the photograph, since it is found in a considerable number of sections. This would correspond to the usual riband-like appearance of these vessels. Some distance up the nerve it is joined by another branch, about half its size, from the supporting trabeculae (Fig. 2). Unfortunately the series of sections is not complete enough to say exactly whence this vessel comes, so that one cannot be sure whether it is another similar branch from the choroid or an offshoot from the central vein. The latter is perhaps more probable, as it lies well within the nerve substance and nearer the central vessels more peripherally. The piece of nerve excised with the globe does not extend far beyond the point of junction of the two veins, so that the final termination of the vessel formed by them is unknown, but so far as the sections go it does not leave its position close to the pial sheath. A normal central artery and vein are present in the usual position.

It is unfortunate that the fundus could not be observed ophthalmoscopically in this case, and that the final link of a chorio-vaginal vein, observed both clinically and microscopically, must still await future research. But there can hardly be a doubt that this huge choroidal vein, plunging into the deeper tissues in close proximity to the papilla must, if visible at all, have presented the appearance of a chorio-vaginal vein. It will be noted that its course confirms the supposition of Oeller and van Geuns that these veins must pass backwards by one of the sheaths of the nerve.

The explanation of van Geuns that chorio-vaginal veins arise from an unusual development of the normal anastomoses round the nerve entrance seems to me by far the best. The supposition that they are merely abnormally

placed vortex veins might be feasible if they ran outside, or even within the dural sheath, but is highly improbable when they are found to lie within the pia. Moreover, as already pointed out, the theory of abnormal vortex veins becomes very unlikely when there are more veins than one. Van Geun's hypothesis has also the advantage of deriving them from structures already present normally, instead of supposing new and abnormal formations.

According to Leber, the anastomoses between twigs of the choroidal and central vessels around the nerve entrance are in three directions—(1) backwards to the pial sheath; (2) straight inwards to the region of the lamina cribrosa; (3) forwards to the papilla to take part in its vascularisation. It seems that each of these is capable of congenital or pathological enlargement. The first is evidently the anastomosis involved in the cases now under consideration, as is shown by the anatomical relations of the abnormal vein, which remains close to the pial sheath during the whole of its course, and is connected (probably) with the central vein, not directly, but through a greatly enlarged trabecular branch. In both of these points it corresponds to the normal vessels of the pial sheath. The second anastomosis when enlarged gives rise to "optico-ciliary" veins, as has been proved anatomically by Elschmig. It would appear therefore that the difference between chorio-vaginal and optico-ciliary veins is not merely one of degree, as van Geuns has stated, but that a different anastomosis is involved. The third anastomosis probably gives rise to the little nets and bunches of tortuous vessels sometimes seen at the edge of the papilla in cases of obstruction of the central vein or its branches. It should be noted that none of these anastomoses has anything to do with the circulus of Zinn, which is a

purely arterial circle belonging to the scleral part of the nerve entrance and with no corresponding venous twigs.

Chorio-vaginal veins have always been regarded as congenital abnormalities, indeed Oeller considers their presence a proof that any associated crescent is also congenital. Although a probable connection with the anastomoses about the nerve head has been pointed out, it has been considered that this connection was merely in the form of a congenital enlargement of these anastomoses. This, however, does not take account of their frequent association with high myopia. It has indeed been suggested that they are not more frequent in myopia but only more frequently visible owing to choroidal thinning. If, however, such enormous veins passed from the choroid into the pial sheath with any degree of frequency they could not have failed to be observed microscopically, and reported. There can, I think, be little doubt that there is a definite connection between their occurrence and high myopia.

I would suggest that the connection is one of cause and effect. In the myopic globe the yielding and expansion of the tunics chiefly or entirely affects the posterior hemisphere. The vortex veins are therefore practically left in their normal positions, while the posterior pole of the eye is removed a long distance from them. This must constitute a certain hindrance to the return of the venous blood which normally flows from the posterior pole to the equatorial vortex veins. But in addition the choroid, as is well known, undergoes much thinning and atrophy in consequence of the stretching to which it is subjected, and this must add considerably to the difficulty which the venous blood encounters in finding its way by the normal channels from the region about the

nerve entrance. Especially will this be so on the temporal side of the disc, because it is on this side that the giving way of the tunics is always most pronounced in myopic eyes. Under these circumstances the blood from the posterior pole of the eye, meeting with obstruction to its normal outflow, will seek out any anastomotic channels which it can find, and these are already provided for it at the nerve entrance.* The enormous size of these veins in some cases need cause no astonishment when it is remembered over how long a period the conditions giving rise to them are in action. Of all bodily structures the vascular system is perhaps the most capable of modification under altered circumstances. As a concrete instance one may recall how after ligature of the common iliac artery the middle sacral and its obscure anastomoses may assume the appearance and functions of important arterial trunks. It is also well known, and the same instance will serve to illustrate the fact, that existing rather than new-formed structures are made use of in compensatory processes.

If the above line of argument be correct chorio-vaginal veins, in most cases, will only be congenital in so far as the high myopia, and the intra-ocular conditions associated with it, may be congenital,—a point which seems to be unsettled; but in any case they will tend to increase in size and number with progression of the myopia. At the same time, while claiming for them a special association

* An explanation exactly the opposite of the one given here has been put forward by van der Hoeve. He believes that the insertion of an abnormal vortex vein at the posterior pole of the eye is the cause of the yielding of the ocular tunics which produces the myopia, just as the region of the normal vortex veins yields an equatorial staphyloma. It seems highly improbable that the abnormal insertion of a vessel could cause the whole posterior half of the eye to give way, and reasons against regarding these vessels as abnormal vortex veins have already been given.

with high myopia, I would not altogether deny the possibility of their occurrence as a pure congenital abnormality. The vascular system is notoriously variable, and where minute anastomoses normally exist there is always a probability of their occasional occurrence as large trunks. This would account for the rare cases in which they are found in emmetropic or hypermetropic eyes, though even in these cases the possibility of an abnormally small development of the ordinary vortex veins, or of a decreasing hypermetropia producing the same effects as a progressive myopia is to be remembered. It will be recalled that the usual explanation of many of the congenital abnormalities of vessels elsewhere in the body is the occlusion or maldevelopment of the normal channel, and the enlargement of its collaterals, an explanation which can often be shown to be probable from the anatomical course of the abnormal trunk.

It is interesting to observe also that enlargements of the other anastomoses about the nerve head are certainly not always congenital. Thus van Geuns reports a case in which an optico-ciliary vein developed during the course of an optic neuritis and disappeared afterwards, and there are other cases in which they have occurred with neuritis. The probable association of this with vascular obstruction in the nerve need hardly be pointed out. Indeed van Geuns divides optico-ciliary veins into congenital and acquired, and believes that in the former the blood flows from the choroidal veins to the central, and in the latter in the opposite direction. The enlargement of the third form of anastomosis, the little nets on the disc margin, is probably always acquired.

It will be seen from the above description that the term "chorio-vaginal," first used by Oeller, is the best for these

veins, as it describes their anatomical course. The term "posterior vortex" veins should be given up, as it implies that they are abnormally placed vortex veins, a supposition which is untenable both on anatomical and theoretical grounds.

To sum up, I would submit that chorio-vaginal veins are, anatomically, large veins which pass from the choroid into the nerve and course backwards close under the pial sheath; that they are formed by enlargement of the anastomoses which normally occur in this situation; and that this enlargement constitutes in most cases a collateral circulation to compensate for a hindrance to the exit of blood by the normal vortex veins.

DESCRIPTION OF PLATE.

FIG. I. $\times 30$. (A) The junction of the dural sheath (D) of the nerve with the sclerotic. It also marks the anterior end of the inter-vaginal space (I). (B) The termination of the scleral promontory, and commencement of the lamina cribrosa. It indicates also the ending of the choroid and sclerotic. (V) A very large vein passing out from the choroid, piercing the scleral promontory near its termination, and running up the nerve close to and within the pial sheath (P).

FIG. II. $\times 30$. The coalescence of the vein shown in the previous figure with a large trabecular branch some distance up the nerve. The vein derived from the choroid is to the right and is the larger of the two. It still maintains its position close under the pial sheath. Nearer the lamina cribrosa the trabecular vein was more widely separated from the choroidal, and closer to the central vein, but no direct connection with the latter could be traced. The vein formed by the junction of these two trunks did not leave the pial sheath so far as the sections extended. The nerve is highly atrophic, and the inter-vaginal space very wide. A normal central artery and vein were present in the usual position, but are not shown in the photograph.

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REVIEWS.

ELSCHNIG (Vienna). **Eye Affections due to Autointoxication.** *Klin. Monats. f. Augen.*, Nov., 1905.

AUTOINTOXICATIONS may be conveniently divided into the *Histiogenic* and the *Enterogenic*. Eye diseases due to the former class are fairly familiar to us, since they include those dependent on gout, diabetes, uræmia, chlorosis, Graves's disease, pregnancy, etc. But the latter class of intoxications has been much less studied, and of eye affections due to such nothing is said in our text-books, while records of them in the clinical journals are very few indeed. Elschnig has directed his attention to the subject for the last ten years and his paper is founded on cases occurring in his private practice during that period.

The recognition of gastro-intestinal autointoxication is perhaps not very easy. The most definite symptom of it is

the presence of abnormal organic compounds, such as phenol and other ethereal sulphates, in the urine. The estimation of these bodies, however, hardly comes within the scope of everyday urine testing, and a more practical indication is the presence of indican in increased amount in the urine. This, as a rule, means decomposition of albumen in the digestive tract, though it may also be present in fevers, chlorosis, leukæmia and neurasthenia. It is said not to be present in simple constipation.

It is the nervous apparatus of the eye, and the corneo-sclera and uvea which are especially prone to react to the gastro-intestinal toxins.

Nervous apparatus. It is recognised in text-books of neurology that gastro-intestinal autointoxications may give rise to various *paralyses of the internal and external eye organs*; the symptoms are similar to those of (exogenic) ptomaine poisoning; the prognosis appears to be good only in the slighter cases. Elschnig has one case of this nature to record:—

A bank clerk, pale, dyspeptic, with offensive breath; not syphilitic. Disturbance of vision for a week. Right pupil half-wide, motionless; distant vision normal; punctum proximum 15 cm. with +3D (with the other eye 12 cm. without a glass). There was no indication of systemic nervous disease. The urine gave an increased indican reaction. The pupil and accommodation became normal under treatment directed to the digestive organs.

Optic nerve affections, due solely to this cause, seem to be very uncommon; but more than one writer has put forward the view that digestive disturbances may play an important though accessory part in the production of tobacco and alcoholic amblyopia.

As regards functional nervous affections, Elschnig refers to cases of scintillating scotoma, as well as various neurasthenic symptoms, which seem to arise in connection with stomach troubles, chronic intestinal catarrh or constipation, and are dissipated when those conditions are treated; but he remarks that it must always be doubtful whether the symptoms are really due to autointoxication, or to reflex irritation from the digestive organs.

Affections of the corneo-sclera and uvea. A man, aged 30, had suffered for several years from repeated attacks of superficial marginal ulcers of the cornea, some of them severe and accompanied by slight iritis. He had no general disease, nor could any local cause for the attacks be discovered in lids, conjunctiva, or nose. The urine gave an increased indican reaction, but was otherwise normal. Enquiry into his mode of life elicited that with a sedentary occupation he combined great irregularity in his meals, and sometimes ate so voraciously as to produce vomiting. He suffered also from constipation. A diet cure, undertaken in the summer of 1903, had a considerable effect in diminishing the attacks, but with a return to his former habits of life they recurred, until, in March, 1905, his doctor instituted a strict dietetic régime, and since that date he has had no more attacks of keratitis.

That *relapsing scleritis*, in the great majority of cases, owes its origin to digestive disturbance seems to Elschning indubitable. He has seen no case in which acquired syphilis could be demonstrated as the cause of the affection; no case in which, even though certain signs suggestive of hereditary syphilis were present, antisyphilitic treatment produced any appreciable effect on its course. The only general treatment which in severe cases has produced any amelioration, either in the attack itself or in the tendency to recurrence, has been one founded on regulation of the diet and repeated disinfection of the digestive canal.

What is true of the deeper forms is true also of the rarer superficial type, or *episcleritis periodica fugax*. Of this he quotes a case:—

A man of 28 had suffered for four years from repeated attacks of this nature, the intervals varying from a week to a month, each attack lasting three or four days. Treatment by iodides and subconjunctival injections had been fruitless. He was pale, thin, and previously had prolonged stomach catarrh, and now suffered constantly from constipation and piles. There was a positive indican reaction in the urine. He came under Elschning's care in January, 1904, the attacks being then almost weekly. He had his diet regulated and was given aloes; by the end of May he had had only two slight attacks. He then went through a Carlsbad course, and has since had only occasionally a slight threatening of an attack in the left eye.

The gastro-intestinal factor is of still more moment in certain affections of the uveal tract, and there are in particular two forms of *irido-cyclitis* in which an autointoxication may be confidently looked for, either as the sole, or as an important accessory cause. The first occurs especially in women, and is characterised by a chronic course, deposits in the anterior chamber, and opacities in the vitreous. The patients give a history of constant digestive irregularities and constipation. An acetone-like odour of the breath and the presence of indican in the urine point to the presence of toxines of intestinal origin; and a therapeusis directed towards the digestive troubles is the only one which influences the ocular condition for the better.

The second form is a recurrent iritis; the subjects of it are apparently quite healthy individuals, often men about the middle period of life; one eye is attacked by acute irido-cyclitis, recovers, and after a longer or shorter interval a second attack occurs, and this process is repeated until in many cases the eye becomes blind. Antisyphilitic remedies are not of the slightest use, but, on the other hand, treatment of the digestive organs produced complete arrest of the process in five out of seven cases, and in the other two, in which it was very imperfectly carried out, there was considerable amelioration. One of these cases may be quoted.

A literary man, aged 45, had had every year since 1888 (with the notable exception of two years during which he adopted vegetarian diet) severe attacks of irido-cyclitis in the left eye, lasting for several weeks; no treatment had been of avail, either in lessening the severity of the attacks when present or in preventing their recurrence. He came into Elschmig's hands in March, 1901, the left eye being at that time much inflamed, with hypopyon and posterior synechiæ. He was a somewhat pale man, with bad digestion and exceedingly careless as to his meals. He had no general disease, and had not had syphilis. The urine gave a strong indican reaction. He was ordered a regulated diet, and carbonate of guaiacol as a digestive disinfectant, and there was no relapse till June, 1902, when an attack of iritis followed a digestive disturbance, but was cut short in a week by calomel. A similar attack followed an excess in diet in February, 1903, and was similarly disposed of. In March and October, 1904, there were two slight attacks, clearing up, under calomel

treatment, in a few days. In November, 1904, a more pronounced attack, with exudation in the anterior chamber and vitreous opacity, the inflammatory symptoms lasting a fortnight. In June, 1905, a slight attack, yielding in a few days to calomel, followed an attack of indigestion. In this case great amelioration followed the treatment adopted, and still more marked results might have been expected if it had been possible to get the patient to carry out the treatment efficiently.

Intestinal irregularities, especially constipation, may play a part in certain cases of *irido-cyclitis following operation*; and Elsenig believes that an attack of *glaucoma* may occasionally be determined by digestive disturbance, either reflexly, or by the absorption of toxins. He thinks it probable that gastro-intestinal intoxication may be a causative factor in many chronic *choroidal affections*, though he has not any evidence on the point to offer; while with regard to *cataract* he has somewhat more definite ground in the fact that tetany is recognised as an element in the production of a certain form of cataract, and that tetany in children is, as a rule, accompanied by increased indican reaction in the urine. Finally, he refers to *recurrent styes* as a slight but troublesome affection in which in some cases no local treatment will prevent the attacks, but the discovery of a high indican content in the urine will point the way to a treatment of the digestive organs which will have the desired effect.

In a few words at the conclusion of his paper Elsenig indicates the methods of *treatment* which he finds best fitted to bring his views on etiology to practical issue. In cases with an acute onset calomel (the disinfectant of the digestive tract) is the sovereign remedy. In the chronic, creeping affections treatment must vary according to the condition of the urine, of the digestion, and of the general health. In most cases, in the absence of any severe disease of the digestive organs, it is advisable to begin with an exclusively milk diet for several weeks, and then to allow a more mixed dietary in which milk still forms a preponderating element, or a diet such as that prescribed for the gouty diathesis. In the relapsing affections, in progressive scleritis and irido-cyclitis, a course of disinfection of the intestine by guaiacol carbonate ($7\frac{1}{2}$ grains three or four times a day after food) for four to six weeks several times a year, and finally supplemented by a Carlsbad cure, seems the best treatment. But in these cases, even though our view of

their causation be correct and our treatment carefully carried out, we must not always expect to be rewarded by complete success, for the most experienced clinician will admit that the entire elimination of decomposition products from the digestive canal is not always within our reach.

W. G. L.

A. LÜRSSEN. The Bacillus of L. Müller and Trachoma.

Zeitschrift für Augenheilkunde, November, 1905, p. 443.

THIS hæmophile bacillus described by Müller resembles the influenza bacillus, and is by him believed to be the active agent in the production of trachoma. Other observers have been unable to find it in trachoma, or when they did find it have pronounced it to be either the influenza bacillus, or the Koch-Weeks bacillus, and attribute to it no connection whatever with trachoma.

Lürssen publishes the results of investigations made at Pfeiffer's clinique upon the various hæmophile bacilli found in a large series of cases of trachoma. Three varieties of these bacilli were found—(1) The Koch-Weeks bacillus; (2) a bacillus of the type of the Pfeiffer pseudo-influenza bacillus; and (3) Müller's bacillus.

Müller's bacillus was only found five times in 77 cases, while the Koch-Weeks bacillus was found eleven times, and the pseudo-influenza bacillus four times. But the positive proof that Müller's bacillus has nothing to say to trachoma was given in the person of Lürssen himself and two of his friends. A pure culture was introduced into the conjunctival sac of all three, and resulted in a mild attack of catarrhal conjunctivitis, which passed off in a few days without any evidence of trachoma whatever.

J. B. S.

Localisation of a Foreign Body by Means of Radiography.

S. HOLTH (Christiania). *Annales d'Oculistique*, December, 1905.

SWEET (Philadelphia). *Ophthalmoscope*, January, 1906.

PRECISE localisation of a foreign body in the eye, even with the assistance of the Röntgen rays, is always a difficulty, and many have been the methods proposed to overcome it. Holth's

plan is not inconvenient, and may thus be very briefly explained. He takes two pictures of course, one through the temples, the plate being on the injured side and parallel to the sagittal plane, the other antero-posterior, the plate being held by appropriate apparatus in front of the eye, parallel to the coronal plane but tilted so as to lie with its long side in contact with the side of the nose. The head is immobilised chiefly by means of a firm chin rest and a somewhat broad metal plate which (wrapped in a clean napkin) is held between the patient's teeth. He at the same time fixes an object (or a light should vision be too bad for fixation of an object) held one or two metres in front and exactly on the same horizontal plane with the eyes. Cocain is given before the picture is taken, and two small indicators of lead like minute buttons are attached to the limbus by a stitch, one above and the other below the vertical meridian of the cornea. The distance separating them can be precisely known; the apparent distance on the plate, by reason of the interval separating plate and eye is about 10 per cent. more. Taking it, in the first place, for granted that the eye is normal in refraction, or nearly so, its antero-posterior diameter is 24 m.m.; if the foreign body is shown on the plate, after reduction to true dimensions, to be situated less than 20 m.m. posterior to the line joining the two buttons, or—what is the same thing—less than 23 m.m. behind the apex of the cornea, it is within the globe. Allowance must, of course, be made for the rotundity of the globe: thus a foreign body may pass in a sagittal direction along a line starting from near the margin of the cornea,—in such a case a journey of the same number of millimetres might take it outside the globe. A simple little piece of apparatus has been of great service to Holth in these calculations. He has had a metallic ball constructed of the exact size of the normal eye, and a series of rings made for it of such size that the largest will just allow the ball to pass through; the others lie upon the ball separated from one another by exactly 1 m.m. On this ball are marked the two indicating "buttons," the cornea, and the pupil: it has facilitated, he says, the rapid calculation of the position of any foreign body shown in the plates.

Sweet's method, of which the description is not altogether perspicuous, is to place in front of the eye two parallel rods ending in knobs: these rods are parallel also to the long axis of the photographic plate which is fixed to the (injured) side of

the head. The ball at the end of one of the rods is placed immediately in front of the centre of the cornea, and the other nearer to the plate. The X-ray tube is placed about 18 or 20 inches towards the uninjured side of the head and slightly in front, so that the rays pass obliquely through the injured eye to cast on the plate shadows of the two rods which stand straight forwards from the face, and of the foreign body. When the tube is above the plane of the parallel rods, since it is also anterior, the shadow of that ball which is in close relation to the cornea will be at once behind and lower than that of the other. A second plate is exposed with the tube in the same position otherwise, but below the plane of the rods, when the same ball will cast its shadow posterior and superior to that of the other. Since the exact separation of the two balls is known, the distance separating the shadows of them antero-posteriorly upon the plate gives the precise position of the anode. On a chart indicating the horizontal section of the globe one then draws a line joining anode, corneal ball, and its shadow, and another joining anode and the shadow of the foreign body, which must therefore lie somewhere along that line. The process is repeated on a diagram representing the vertical sagittal section of the globe. With these diagrams are then combined the results obtained by a similar treatment of the plate at a second exposure and the crossing place of the lines of shadow cast by the foreign body is then precisely indicative of its situation in the eye or orbit.

W. G. S.

CLINICAL NOTES.

TATTOOING OF THE CORNEA.—For several years Kugel (Bucharest) has been in the custom of employing a Graefe's knife, or still better a keratome, in place of the more usual needle. His method is to make a series of perhaps 30 short lines in the scar tissue with this instrument. On application of the pigment he thus has a number of black lines from which the colouring matter in the course of a few weeks spreads gradually into the intervening tissue. The ink is employed of course in a very thick, pulpy condition. The advantages which he claims for this method are they the eye bears the small incisions better than the needle-pricks, and thus there is both less reaction afterwards and less carrying away of the pigment

molecules. The eye recovers more quickly also. For these reasons one is sometimes enabled by this method to tattoo an eye which could not endure the needle operation.—*v. Graefe's Archiv*, lxii., 2.

OPTIC NEURITIS IN SYRINGOMYELIA.—Weisenburg and Thorington publish notes of a case in a girl 16 years of age. It is apparently only the third recorded instance of the association of optic neuritis and syringomyelia. The two previous cases (reported by Bullard and Thomas in America, and by Saxer in Germany) occurred in patient $6\frac{1}{2}$ and 16 years of age; the syringomyelia in these cases was not diagnosed during life. The case now reported is purely clinical, but the diagnosis is scarcely open to doubt. The girl is blind in the right eye, and counts fingers at 10 in. with the left; both eyes show well-developed papillitis passing into atrophy. Two explanations are offered for the optic neuritis in syringomyelia—(1) internal hydrocephalus; (2) the presence of a tumour. In reference to tumour, the writers state that “neither in the two previous cases *nor in ours*, can the possibility be admitted.” In view of such magnificent dogmatism the *post-mortem* report of their case will be interesting.—*American Journ. of Med. Sciences*, December, 1905.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

February 8th, 1906.

CLINICAL MEETING.

Dr. C. J. OLDHAM, Vice-President, in the Chair.

A Case of Staphyloma Posticum Verum (Weiss).—Mr. A. Stanford Morton.

W.G., aged 49, came for treatment on account of defective sight. The vision in both eyes was less than $\frac{6}{60}$, and with -30 in each eye it improved to $\frac{6}{36}$. The fundus in both showed some atrophy of the choroid round the discs extending outwards towards the macula, and to the inner side there was a dark crescentic line with its concavity towards the disc, and separated from the latter by a space in which the choroid was much thinned. The concave edge of this dark line was distinctly raised as shown by the retinal vessels.

Sections of a Case of Congenital Anterior Staphyloma, previously shown by Mr. Lawson.—Messrs. Arnold Lawson and G. Coats

This case was shown at the Society's meeting on December 8th, 1904

(*Trans. of Soc.*, 1905, vol. xxiv., p. 314); and the subsequent history is that 6 weeks later, when the child was 16 weeks old, the eye had spontaneously ruptured.

The pathological examination showed the lens to be absent, though a piece of capsule was found adherent to the back of the cornea; the retina was degeneratad, detached, and folded, extending forwards as far as the piece of lens capsule to which it was adherent and at which spot the perforation existed. The cornea was found infiltrated at the periphery with round cell exudation, while at the centre its laminated structure is almost lost. Bowman's and Descemet's membranes are fairly well preserved at the periphery, but in the centre are entirely absent. Some vascular reaction was visible, most marked at the centre of the cornea near the perforation, in which region the epithelium was found thickened, though in some places it was replaced by exudation of polymorphonuclear leucocytes.

The iris is adherent all along the back of the cornea, except at one part of the periphery, and in this situation the angle of the anterior chamber is normal.

These points in the pathology go to show that the condition is more likely to have been due to ulceration from without than to congenital malformation. The iris, ciliary body, pars plana, ora serrata, and beginning of the choroid all bear the usual relations to each other, as also the periphery of the cornea, Descemet's membrane, ligamentum pectinatum, spaces of Fontana and the Canal of Schlemm, but the former group of structures is pushed forward on the latter.

Superficial Punctate Calcareous Film of Cornea.—Mr. T. Holmes Spicer.

This was the case of a girl, aged 16, who had interstitial keratitis in her right eye when she was 8 years old, which cleared well after a favourable course. Three years ago she became deaf; and while this eye was bad her brother was being attended for irido-cyclitis, the cause being syphilis. Ten months ago the left eye became affected with interstitial keratitis, the cornea being opaque all over with many vascular patches, a bound down iris, and keratitis punctata. Seven months later the inflammation had subsided, leaving a slight central opacity of the cornea and keratitis punctata. This opacity consisted of a group of small, isolated, dirty white dots, separated from one another by clear corneal substance, and which were proved to be superficially situated. The epithelium over them was not raised. Mr. Spicer was of opinion that these spots were of the same nature as calcareous band of the cornea where hyaline bodies have replaced some of the calcareous matter, thus leaving clear spaces.

Case of Couching of the Lens.—Mr. T. Holmes Spicer.

G.B., aged 48, came to St. Bartholomew's Hospital on February 13th, 1903, complaining of inability to see with the left eye ever since an injury to it three years ago; he said he had always been short sighted. Twelve months ago he had an attack of pain and inflammation in the right, which afterwards became blind.

The eyeballs were prominent, the vision in the right was only light perception, while with his left he could just discern hand movements and light projection was good. The right eye showed all the evidence of irido-cyclitis with keratitis punctata, a lowered tension and an opaque lens. In the left eye the lens was cataractous, displaced backwards and slightly to the left, and tilted.

On February 24th, under cocaine, an attempt was made to couch the lens by means of a Scarpa's needle, which was placed through the sclerotic behind the ciliary body. After bringing the needle forward between the iris and the lens, the capsule was freely lacerated, in order to produce absorption and subsequent shrinking of the lenticular substance, and the lens thrust backwards and downwards, exposing a clear pupil. The next day the lens had floated up again, so that on March 3rd, the operation was repeated. The result was entirely satisfactory, the eye remained quiet throughout, the vision improved to $\frac{6}{60}$, and the man was able to resume his occupation as a hawker and again earn his living. A good deal of choroidal atrophy was found in the fundus. Mr. Spicer considers that the operation of couching ought not to be too hastily condemned, as there are some special conditions which fully justify the operation. In the present case, the arguments against scoop extraction, the only other alternative, were the presence of cyclitis and detachment of the retina in the other eye, the probability of much loss of vitreous, and the fact that both eyes were myopic.

Coloboma of the Iris with a Bridge. (2 cases).—Mr. E. Treacher Collins.

I.—Lilian H., aged $2\frac{5}{12}$, was brought to the Royal London Ophthalmic Hospital with the statement that the child's eyes had been in their present state since birth. On examination there was found a coloboma of each iris extending downwards and slightly inwards as far as the periphery; the pupillary area was divided into two parts by a bridge attached to the superficial layers of the iris at the small circle, having the same colour as that structure, and consisting of iris tissue but without striation. Nystagmoid movements were well marked, and the left eye was divergent. Ophthalmoscopic examination showed an extensive coloboma of the choroid extending up to and partly surrounding the disc.

II.—Florence B., aged 7, has had defective sight since birth. Both pupils show pear-shaped colobomata with the smaller end diverted downwards. Across the lower part is a bridge consisting of two parts in close contact with each other, the upper division is on a posterior plane and seems to consist only of a piece of uveal pigment, the lower one is made up of iris stroma and is attached to the front of the iris.

In the right eye much the same condition exists, but there is a distinct space between the two portions of the bridge through which the fundus reflex can be seen.

In each eye there is an extensive coloboma of the choroid, and both eyes exhibit nystagmoid movements. Right and left vision = $\frac{6}{60}$, and J14 at 12 inches, not improved by glasses.

A bridge of this character stretching across a coloboma is uncommon, the usual form being the filamentous remains of the pupillary membrane; it is generally formed at about the position where the free edge of the pupil ought to be, had the coloboma not been present.

The explanation of the existence of this bridge was thought to be due to the failure of development of one of the loops of vessels given off from the anterior ciliary artery to anastomose with the hyaloid artery round the anterior part of the fibro-vascular sheath of the lens.

Persistent Œdema of Lids.—Mr. Arnold Lawson and Dr. G. Sutherland.

A child, aged 12, has been under treatment at the Paddington Green Hospital for 6 years with persistent œdema of both eyelids which came on 3 months after an attack of measles. In both eyes the upper lids are so swollen that they hang over and constrict the palpebral aperture, and the thickening of the tissues interferes with the normal action of the levator palpebræ. From time to time this œdema subsides, leaving loose redundant folds of skin.

No treatment seemed of any avail, and no measures of an operative nature were thought advisable.

Concomitant Divergent Strabismus with Associated Lid Movements.—

Mr. Arnold Lawson and Dr. G. Sutherland.

This was the case of a boy, who had had strabismus since early infancy. The right eye always fixes, the left is divergent and lower than the right. The left upper lid droops over the globe concealing the cornea. On screening the right eye, the left fixes and the lid is raised but not perfectly; the right lid seen behind the screen is strongly retracted and the eyeball moves up and out. On directing the patient to look upwards with both eyes open, the upward movement of the left is impaired and cannot go beyond the middle line; if, on the other hand,

both eyes are directed downwards, the right eye lags and diverges instead of following the left, whose movements are normal; the inferior rectus of the right eye can only be made to act when screening the left. The paresis of the left superior rectus is therefore complete, while that of the right inferior rectus is only apparent.

$$\text{R.V. } \frac{+1 \text{ sph.}}{+ .75 \text{ cyl. ax. vert.}} = \frac{6}{6} \quad \text{L.V. } \frac{+.75 \text{ sph.}}{+ 1.25 \text{ cyl. ax. vert.}} = \frac{6}{6}$$

Case of Detachment of the Retina in a Boy ? Neoplasm.—Mr. Sydney Stephenson.

This was the case of a boy, aged 9, seen at the Evelina Hospital on December 12th, 1905, complaining of bad sight and pains in the head. For 3 years the sight in the right eye had been defective, and 2 years ago (perhaps longer) he had a fall from a first floor window, striking his right frontal region. He was rendered unconscious for a short time after the accident.

One week ago, he was suddenly seized with severe pain in the right frontal region.

$$\text{R. vision is P.L., and T. +1} \quad \text{L.E. } \frac{6}{60} \text{ c } \frac{-8 \text{ sph.}}{-2 \text{ cyl. } 120^\circ} = \frac{6}{6}$$

The pupil, which is 5 m.m. diameter, is almost immovable to light; a steep greyish-white detachment of the retina occupies the upper part of the fundus, which is smooth and not tremulous. A simple detachment is seen below at the extreme periphery which is tremulous. On February 7th, 1905, the eye was in exactly the same condition.

There is some evidence here of neoplasm of the choroid, though on the other hand the injury, condition of myopia in the other eye, and a negative result by transillumination are against this view.

Plexiform Neuroma of the Upper Lid and Temporal Region.—Mr. Ludford Cooper.

Amy S., aged 14, came for treatment regarding her right upper lid which was swollen and pendulous, the thickening including all the tissues from the skin to the mucous membrane. There is some ectropion, and much difficulty is experienced in raising the lid sufficiently to expose the cornea. The eyeball is small and shrunken, the cornea hazy, the lens opaque, and the tension normal. There is some thickening of the frontal and squamous portions of the temporal bone, and the area of skin over it is slightly pigmented. The condition was thought to be congenital.

Growth on the Upper Palpebral Conjunctiva.—Mr. E. E. Henderson.

E.B. was seen on February 5th, 1906, at Mr. Lang's Out-patients at the Royal London Ophthalmic Hospital. For some time something

had been felt slipping about over left upper lid, and during the last fortnight it has been seen projecting from underneath.

On examination an oval mass was found protruding from under the lid 2.5 c.m. long by 1.5 c.m. broad, with a red, smooth surface, attached by a pedicle consisting of conjunctival tissue to the upper fornix. No history of tubercle.

Case of Ectopia Lentis.—Mr. H. H. B. Cunningham.

Martha L., aged 5, came for treatment because her mother noticed that she held objects close to her eyes in order to see them.

In both eyes the lenses were found to be displaced upwards and inwards, and there is a semi-lunar gap in the suspensory ligament occupying the lower quadrants, though in the right eye this gap extends up some little distance on the outer side; there is no notch in the lens, nor is there a coloboma of the iris or choroid.

Retinoscopy shows

R.	L.
$\begin{array}{c} -9 \\ \hline -8 \end{array}$	$\begin{array}{c} -4 \\ \hline -1.25 \end{array}$

MALCOLM L. HEPBURN.

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TRANSIENT BLINDNESS DUE TO SPASM OF THE RETINAL ARTERY.

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CASES of transient loss of sight, believed from their character and associations to be due to interference with the retinal circulation, are by no means rare, and many references to them are to be found in the literature of the subject.¹ The instances where the fundus has been examined during the attack are, however, few in number.

The duration of such attacks varies very greatly, from a few minutes to hours or even days. It is in the more prolonged attacks, naturally, that opportunities for examination have usually occurred, and it is on their character, therefore, that our ideas of the appearances to be observed are chiefly based. Of these cases the most recent with which I am acquainted, and that most fully described, is one reported by Wagenmann,² who fully discusses the subject and gives many references to the previous literature.

His patient was a gentleman of 69, who had for two months had frequent attacks of total or partial loss of sight in the right eye, lasting from some minutes to a few hours. In the total attack which was observed, the retinal arteries were found quite empty, and the veins reduced in calibre. After ten minutes, the arteries showed a thin red line of blood; within half-an-hour they had resumed their normal appearance, and the sight had returned to its usual condition. Iridectomy was performed; and for seven months there was complete immunity from the attacks. Then came a severe one, which left the eye almost blind. Wagenmann has collected various similar

observations, in one of which the condition was attributed to ischemia of the retina, in one to a passing embolus, in others to spasm of the retinal artery.

Noyes³ records two cases in which he had observed a similar condition; in one of these the patient became totally blind in the course of about ten minutes, and remained so for sixteen hours; twenty-four hours after the commencement of the attack, when seen by Noyes, he had only dim perception of objects (fingers at six feet). The arteries were found very much contracted; the veins normal. Under the use of amyl nitrite, vision became normal within twenty minutes. Loring⁴ mentions that he had "seen several of these cases," in one of which he says that the "attack was at once cut short by the use of nitrite of amyl." He does, not, however, distinctly state that he had examined the fundus of the affected eyes during the attacks.

Transient diminution in the calibre of the retinal arteries has also been observed in epilepsy, in migraine, in the cold stage of malarial fever. In some toxic conditions, especially in poisoning by quinine, great contraction of the retinal arteries is a very prominent feature.

Localised contraction of the retinal vessels has been much more rarely met with. A very curious observation is recorded by Raynaud,⁵ in one of the cases described by himself of the disease which bears his name. There was partial loss of vision during the intervals between the attacks of lividity of the extremities, which passed off when that condition returned. Ophthalmoscopic examination showed that the branches of the retinal artery were at this time narrower close to the disc than at the periphery; and at times "a sort of partial strangulation" could be seen. There was extremely marked and exten-

sive pulsation in the veins. During the attacks, when the sight was normal, the pulsation in the veins was less marked; but the arteries showed "partial strangulations which, in parts, made them filiform. By exercising a little patience, the observer might be so fortunate to see these strangulations form before his eyes, last a certain time, then disappear to reproduce themselves on another vessel." These observations, he tells us, were confirmed by Galezowski. I have seen no record of similar appearances in other cases of Raynaud's disease.

The only other case, so far as I know, in which localised transient spasm of the retinal artery has been observed is the very remarkable one described by Benson,⁶ at the Ophthalmological Congress in Edinburgh, in 1894. The patient was a man of 32, who had for four years experienced recurrent transient attacks of loss of sight. Sometimes the eye affected became totally blind; more often only part of the field was lost. The attacks never lasted more than five minutes. On three occasions the eye was examined during an attack, and each time the portion of the retinal artery corresponding to the blind area was found to be empty for three or four disc-diameters. The bloodless portion of the vessel was seen to creep slowly towards the periphery, and whenever it reached a bifurcation of the artery, seemed to fill up suddenly, so that the fundus again appeared normal.

My patient is a gentleman of 88, with the muscles, including the heart, in a feeble condition. His arteries, though somewhat tortuous, are much less hard than is usual at his age; the heart action is regular and the pulse soft. His mental power is singularly good; his memory seldom fails him; and his interest in all that goes on in the world is intense. Except for slight chronic bronchitis,

no lesion of the internal organs can be detected. The urine contains no albumen or sugar. He suffered last autumn from rather severe lumbago; but this had passed off before the attack I am about to describe. Six weeks after the attack, he had a slight localised dry pleurisy. He was at this time unusually depressed and feeble in consequence of a sudden family bereavement, and was almost entirely confined to bed, where he spent most of his time in reading.

On the evening of the 23rd December last, he was reading, half sitting up in bed, when he noticed that he was not seeing so well as usual. On testing the two eyes separately, he discovered that the left was quite blind.

When I saw him, within half-an-hour of the onset of the attack, he greeted me with: "It is going off; I can see a little now." I found that the upper part of the field had some perception; but the lower part appeared quite blind.

On ophthalmoscopic examination (it was unfortunately only possible to use the indirect method), I found that the media were clear, the appearances natural, and the vessels normal except the upper main branch of the retinal artery. In this there was an interruption of the column of blood just beyond the margin of the disc, in a section of the vessel somewhat less in length than one disc-diameter. The position of this part of the vessel could be traced as a whitish streak; but it seemed entirely empty. On the proximal side the vessel was of normal calibre; on the distal side the column of blood was continuous, somewhat less than in the other arteries of corresponding rank, but by no means very small. I could almost fancy that a tiny transparent finger and thumb were nipping the artery, just as one nips an india-rubber tube.

I administered a dose of whisky, the only vaso-dilator at hand, and after chatting to the patient for a few minutes, examined again. This time there appeared to be a fine thread of blood in the portion of the artery which was previously empty; but no other difference could be made out. The lower field was still blind.

I left him to obtain amyl nitrite; and on returning was told: "It is all right now; I can see quite well!" On examination the obstructed artery was found to have recovered its normal appearance. The whole duration of the attack was somewhat less than an hour.

The only explanation possible of the symptoms and appearances described seems to be that there was a localised spasm of the artery. No embolism or thrombosis could have passed away so completely in so short a time; and there was nothing to be seen in the fundus to suggest the presence of either. The circulation was certainly very weak; but the appearances were not those found in stasis. No doubt the spasm had affected either the trunk, or all its branches, at the onset of the attack.

Till now there has been no recurrence of the condition, and nothing abnormal can be detected in the fundus, except that the veins are perhaps a little fuller than usual.

I am not able to assign any satisfactory cause for the spasm in this case, and shall, therefore, not spend time in discussing the possibilities.

It is not a little remarkable that among these cases we have evidence of spasm of three distinct types. In most of the cases the whole artery was empty, and refilled gradually. In Benson's, the small empty portion passed onwards by a sort of peristaltic movement, and refilled suddenly. In mine the still smaller empty portion remained stationary, and filled gradually. This variety

suggests that there must be much to be learned about the innervation of the arteries, and a wide range of causes leading to disturbance of that innervation.

The spasm in my own case is of a very curious type; I do not know that such an extremely limited and fixed spasm of an artery has been either observed or suspected. I find, however, in another muscular tube, the intestine, a curiously exact parallel described by Dr. Hawkins⁷ last January. In this patient laparotomy was performed, and two portions of the intestine were found contracted. A portion of the colon four inches long "was of a pale grey colour, bloodless, strongly contracted and narrowed down to the size of a man's forefinger. The narrowed part passed abruptly into the normal parts above and below. The affected section of the small intestine" (about seven inches long) "presented the same appearance. It was pale, contracted and narrowed. . . . The line of demarcation of this contracted part from the distended and reddened bowel above and below was sharply defined." (There was satisfactory evidence that the contraction was not due to any external constricting cause.) We have here a limited, abrupt spasm of a muscular tube, bearing witness to a condition of its nervous mechanism very different from the normal. It is indeed so anomalous that without very direct and convincing evidence we should have been disposed to regard it as impossible. I think the analogy with the spasm of the artery in my own case interesting and suggestive.

From the standpoint of the ophthalmologist, the chief interest and importance of such observations lies in their relation to the cases of sudden loss of sight with contraction of the retinal artery, which were, at one time, all attributed to embolism.

There are many cases recorded as embolism in which the final attack has been preceded by one or more attacks of transient loss of sight, sometimes partial, sometimes complete. In the latter case, the final attack only differs from the others in that the blindness is permanent. Emboli usually have their origin in the heart or the aorta. That successive emboli from such a distant source should all find their way into the same small arterial branch is so improbable that the hypothesis may be at once dismissed. It is, of course, not impossible that there may be a morbid process in one of the minor arteries, *e.g.*, in the ophthalmic, from which successive emboli may be detached and pass into the retinal artery, of which some are so soft and friable that they break down and leave no permanent damage. Such a sequence of events, however, is also very improbable and must be extremely rare. Where prodromal attacks occur, therefore, the final one is very unlikely to be embolic. There are other features described in many of the cases attributed to embolism which make it difficult to accept this explanation of their origin; but these it would be beside my purpose to discuss.

Even with regard to the pathological evidence, the facts are by no means conclusive. Haab,⁸ who has made a special study of the subject, goes so far as to say that "in not a single instance, not even in which it was very likely to be an embolus, has the proof of embolic nature been at all convincing."

If we look now at the cases where numerous attacks of transient blindness have occurred, we shall find that in many, as in Wagenmann's described above, in one of Loring's, one of Nettleship's, and in another I shall recount later, there has been permanent damage at some period following upon these attacks. Loring⁹ was one of the

first to throw doubt upon the general applicability of the diagnosis of embolism to all such cases; and in one of the cases on which his article is based, there had been attacks of temporary loss of sight in the left eye, sometimes daily, for *twenty-four years*, before the occurrence of one at the age of forty-seven, which produced almost complete blindness of that eye. Nettleship,¹⁰ who lays stress upon the importance of heart weakness in relation to these attacks, narrates in one of his cases a somewhat similar sequence.

We may trace a complete gradation from cases where there are numerous attacks of transient blindness without permanent loss, through those where the transient attacks are the prominent feature and permanent damage appears to be only an incident in the history, to those where one or two transient attacks are soon followed by a permanent one, and those finally where there is only one attack, which blinds the eye. Where blindness occurs, the clinical appearances in the final attack are essentially the same, whether transient attacks have preceded it or not. With such a series before us, it is obvious that embolism cannot be the process which has blinded all these eyes; and, even in the last group, very definite evidence must be obtained before this diagnosis can be securely established.

In view of these facts, the definite proof afforded by such cases as my own and others I have mentioned of the occurrence of spasm in the retinal artery is most interesting and significant. When a case is seen at an early stage in which the signs of arterial blocking are present, the possibility of its being due to spasm should be recognised, and vigorous attempts made, by massage, by nitrite of amyl, and other vascular relaxants, to promote dilatation of the arteries. In this way sight may be saved in

eyes which would otherwise certainly be lost. In cases of recurrent attacks of blindness of this type, a careful search should be made for any constitutional tendency which may predispose to them, with a view to its correction; and care should be taken to promote very free elimination of waste products.¹¹ Wagenmann¹² urges the performance of iridectomy in these cases, and his own experience, and that of other observers, show that it may be of much value.

Proof of the occurrence of spasm in the retinal artery of such a degree as to produce marked symptoms has, however, a much wider interest. We know that spasm takes place in the arteries of the retina, because they are open to our inspection. Does it not seem probable that spasm may also be met with in other situations where its presence is not so readily proved?

I have encountered one case which strongly suggests that such spasm really does occur. For part of the notes of the case I am indebted to Dr. George Mackay.

The patient is a young lady, aged twenty-two, who has had excellent health and seems to have no organic disease. Her eyes are somewhat myopic (-3 D), but otherwise appear healthy, with the exception to be recorded. For eight years or so she has had occasional attacks of loss of sight in one eye., which come on without traceable cause, are not associated with headaches, to which she is not subject, last not more than five minutes, and usually pass off completely. There have been perhaps twenty attacks altogether; in all except one the right eye has been the one affected.

In 1901, after one of these attacks, she found that a defect of sight remained, and was examined some days later by Dr. George Mackay. The field of the right eye

showed a sector-shaped defect in the lower inner quadrant, and the corresponding area of the retina was hazy, swollen and œdematous. The field remains as it was at that time; the arterial branch supplying the blind portion of the retina is extremely small, and in parts can be traced only with difficulty. Several attacks have occurred subsequently, but none of them has done any further damage.

The appearance observed at the time of the attack which damaged the sight, and the present condition of the fundus, demonstrate that the loss of sight was due to some lesion of the retinal artery. The fact that it was one of a series of transient attacks which left this defect, strongly suggests that the lesion was due to a spasm of the retinal artery, which persisted too long for the integrity of the part of the retina affected. No other hypothesis can link together the frequent transient attacks with the permanent damage to the retina following one of them.

So far the case resembles others that have been reported. But there is one singular feature of the attacks which I have not yet mentioned; namely, that each of them commences with what the patient describes as "one side of things looking higher than the other," so that there is confusion of objects; for example, uncertainty on which of the two steps she sees in front of her she is to put her foot. This is evidently a vertical diplopia; it is as transient as the blindness, always precedes it, and sometimes seems to have occurred without being followed by loss of sight.

The association of transient diplopia with the attacks of blindness can hardly be explained except by an extension of the spasm beyond the retinal arteries to those of some part of the extra-ocular neuro-muscular apparatus, most probably to some of the arteries in the orbit which supply the extrinsic muscles.

The precise seat of this extra-ocular phenomenon is, however, not material to my argument; what I wish to insist upon is that we have here very strong presumptive evidence that in this case spasm in the retinal artery is associated with spasm of other blood-vessels beyond the eyeball.

The damage to vision which has occurred in this case is itself most instructive. It is another illustration of the fact, already referred to, that these transient amblyopias of vascular origin, however trifling they may appear, are extremely apt, sooner or later, to lead to permanent impairment of sight.

The occurrence of arterial spasm, limited in extent, but sufficiently intense to produce immediate and severe disturbance of the functions of the part supplied, is, I think, proved by such observations as I have recorded; and if it is proved, it has a far-reaching significance.

Cases are not uncommon in which transient, recurrent, and limited losses of brain-function occur, analogous in various ways to the attacks of recurrent blindness which have been discussed. Like the latter, they often prove to be the precursors of permanent damage. Hitherto they have generally been regarded as due to incipient thrombosis; and in regard to their treatment stress has chiefly been laid upon stimulation of the heart. It seems quite probable that some of them, at least, may be due to arterial spasm: in that case, vascular relaxation would be of much more importance than cardiac stimulation.¹³

Is it not probable, moreover, that some of the transient "functional" disturbances in other parts of the body may be due to localised arterial spasm? Pain has been said to be "the cry of a starved nerve for food": it seems not unlikely that some other paroxysmal pains besides angina

pectoris may be found to yield to the influence of vascular relaxants.

I have ventured into a region which has been but little explored, but on which more light may be expected from future research. May we not hope that farther observation of the anomalies of the retinal circulation will help us to a better understanding of the processes of blood-supply throughout the body?

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THE APPARATUS FOR BJERRUM'S TEST.

BY

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AND

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FOR the convenience of ophthalmic surgeons who may have in contemplation the erection of apparatus for the application of Bjerrum's test for scotomata in the field of vision, we think it may be of advantage if we detail the arrangements we have set up and the approximate expenses thereof. We do this because we are so frequently asked regarding our experience in this matter.

For use in the hospital consulting-room we have found it best to have a large screen constructed, consisting of a light but firm open square of wood measuring seven feet across. This is mounted vertically upon feet provided with castors, after the manner of a school slate or board; it can thus be readily brought forward into the light from a large window,—for the test should be conducted in good daylight,—and when not required can be pushed aside against a wall. Across this screen is stretched a square of velvet, which is slightly larger than the wooden frame, round the edges of which the velvet is brought and firmly tacked down; thus no fastening, glittering nails or what not, can be seen from the position of the patient. Should the frame require any crossbars to support it, these are so placed that they do not touch the velvet at all; the purpose for this arrangement is, first, that they may not “show” through the velvet and so cause differences in the intensity of the black background, and, second, that they

may not interfere with the introduction of the recording pins. The screen must almost reach the floor, that no troublesome light coming from below it may interfere with the test, and the feet are painted a dull black for the same reason.

The velvet must be of good quality, not "thin," lest light come through its substance, and lest its colour may not be equal throughout, and it must, of course, be a pure and rich black, neither purple-black nor brown-black, but the "deadest" possible. We have been able to procure a very suitable material at the price of 4s. 6d. per yard. This being only 18 inches wide, about $12\frac{1}{2}$ to 13 yards are required, and care should be taken that when the lengths are sewn together the seams should, so far as possible, be invisible. We have found it unsuitable to have black threads permanently fixed in front of the screen to mark the meridians or the concentric rings, as these threads become quite visible after a time against the velvet and as they also get in the way of the travelling test object. We have, therefore, adopted the following plans:—First, as regards the meridians: we settle the permanent fixation spot, which should be at the centre of the screen, and measure out from it the various radii at 15° intervals all round. At the very periphery of the screen each of these meridians is indicated by a black velvet button sewn on; these are not sufficiently visible when at the periphery to give any trouble whatever. Next, as regards the concentric circles: if one marks them off in any way then the screen can only be used for one fixed distance (say two metres), whereas it is convenient at times to use the test at one metre, when vision is less good, or for some other reason. One of us (A. H. H. S.) has, therefore, devised a flat rod marked on one side with the tan-

gents showing the various degrees of separation at 1 m. and on the other side with those at 2 m. This may be obtained from Mr. Stevenson, 9, Forrest Road, Edinburgh; but once the needful calculations have been made, it could be constructed by any skilled maker of philosophical instruments. The precise method of use will be seen presently.

The test objects employed are those of Bjerrum himself—discs of ivory of certain fixed size, each mounted on a fine stem. This stem fits into a slit in the end of a black metal carrier or pointer, which is used to move it here and there over the screen. The carrier and a little box containing the test objects are obtainable from Mr. Stevenson, or direct from Liisberg, Ostergade, Copenhagen.

If one prefers to do so, he can, in place of these, employ a flat rod covered with the same velvet as the screen, and discs of pure white paper.

Charts of the field much larger than the usual size have been prepared by one of us (A.H.H.S.), showing the normal dimensions for various sizes of test objects and ready for marking off as the patient is tested; they may be obtained in bundles of 50 from Messrs. Padon, stationers, Edinburgh. It is impossible, accurately, to mark in these details upon a chart of the usual small size.

It is well, also, to have a head-rest fitted up, with an excursion of at least a few inches, so that whatever his height the patient's eye may be in the same horizontal plane as the fixation spot. The one which we actually employ resembles that of a Kagenaar's ophthalmometer, but the side pieces are curved back slightly, so as not to be visible to the patient himself. It stands by the side of the patient's chair, underneath which one of its three feet passes; the actual headpiece is at the end of a horizontal arm.

Velvet gathers specks of whitish dust so readily, that it is well to keep the screen covered. The method we employ is to have a black linen square rather larger than the screen fastened along the top bar behind; from there it hangs over the front of the screen, and is weighted at the foot. When the screen is to be used this is turned over to hang at the back, where it reaches down to the floor, still further obstructing any possible light which might come through or below the velvet.

In actual practice, the points of appearance and disappearance of the test object are marked out on the screen by means of black-headed pins thrust in at the point of demarcation without any reference either to meridians of angular separation from the eye, or to the radii of the screen. When the scotoma has thus been marked out, we take the flat rod above mentioned and in a moment, as it is laid along the various meridians indicated by the peripheral button, can read off on it the angular separation of each pin from the fixation object and prick it off on the chart. Care must, of course, be taken that the side of the rod is utilised which bears the scale corresponding to the distance separating patient and screen.

We find that certain surgeons take exception to Bjerrum's screen test on the rather unsatisfactory ground that an examination by its means takes too long; our experience is that fifteen or twenty minutes, or even much less when one is accustomed to the method, will enable one to come to a definite conclusion in any given case.

The expense of setting up the apparatus is not great. The frame and the head-rest are easily manufactured by any competent joiner; the tradesmen attached to the Royal Infirmary made ours. The velvet, at 4s. 6d. per yard, cost rather under £3; a measuring rod can be

obtained for 5s., and fifty double charts for 5s. Bjerrum's box of tests costs approximately 10s. Considering, therefore, the great value, not merely scientifically, but clinically also, of this test, the total cost is very small; but it is not our intention in this article to dwell upon the merits of the method.

A modification of this screen for use in a private consulting-room, where space is more precious, is to have a square of velvet of two (or three) widths, which can be rolled up like an ordinary window blind; this hangs from a horizontal rod. When the screen is so narrow it is almost necessary to have two alternative fixation spots, one of which is shown and one concealed, to suit the right and left eyes. Such an arrangement gives quite a good clinical test of the presence or absence of the important scotoma, even if it may lack the scientific precision of the more elaborate large screen.

REVIEWS.

EUGEN WEHRLI (Frauenfeld). **On the Anatomical and Histological Basis of So-called Cortical Blindness, on the Localisation of the Cortical Visual Area and of the Macula Lutea, and on the Projection of the Retina on the Cortex of the Occipital Lobe.** *v. Graefe's Archiv*, lxii., 2.

THIS is an important, highly elaborate, and most interesting paper in which the conclusions reached by Henschen and others regarding the location of the visual areas in the occipital cortex are subjected to searching criticism. The first part of the paper is devoted to the careful study of the brain of a patient who became suddenly blind after a convulsive seizure with loss of consciousness. Speech was practically unaffected, and the power of writing was partially retained. Visual memory appeared greatly affected. In the right half of each

field there was a slight return of light perception, but not sufficient vision to make the charting of a field possible. Death occurred about three months after the onset of blindness. At the autopsy there were found softenings in both occipital lobes and involving also the cuneus, gyrus lingualis, gyrus occipitotemporalis, and præcuneus. Both occipital arteries from a point beyond the origin of the arteria temporalis were occluded by old thrombi. The lesions on the left side were rather more extensive than on the right. Wehrli specially notes that at the *post-mortem* the impression made was that the lesions were purely cortical. The brain was hardened in formalin and Müller's fluid and cut on the microtome in serial vertical sections. A very minute description of the naked eye and microscopical appearances is given. The case might be quoted as a classical example of occlusion of the occipital arteries with consecutive necrosis of the cortex in the area supplied by these vessels. In regard to cause, localisation, and extent of cortical softening the case is therefore exactly comparable with those recorded by Henschen and others. Owing to the comparatively short period between the onset of blindness and the death of the patient Wehrli claims that in this case there was no time for the development of secondary degenerations, and therefore the extent of the original lesion could be definitely determined.

The detailed and thorough examination of the brain revealed that the lesions, which on superficial examination appeared purely cortical, were not really so at all. On both sides there was an undoubted primary lesion of the optic radiations. In a series of drawings Wehrli shows how deeply the calcarine and other fissures penetrate and how very readily a cortical lesion on the floor of the fissures would produce extensive destruction of the fibres of the optic radiations. According to the author no case of hemianopsia in which the lesion affected only the cortex has ever been published. He proceeds to criticise in detail well-known cases of supposed cortical lesions causing hemianopsia, described by Vialet, Forster, Sachs, Jaqueur and others. In all these cases Wehrli finds evidence of the co-existence of lesions of the white matter and optic radiations. Not a single case, he maintains, can rightly be used to furnish proofs on questions regarding the exact critical localisation of the visual area. He finds himself specially at variance with the views of Henschen, who claims to have

described lesions mesially situated, and so restricted to the cortex as to give quite decisive evidence on this point. After careful examination of Henschen's cases Wehrli finds himself still more convinced of the non-existence of pure cortical hemianopsia. In fact he considers the cortical lesion relatively unimportant in the production of hemianopsia when compared with the deeper lesions which affect the optic radiations. To show the small influence on vision of purely cortical lesions, the author brings forward a series of negative cases in which extensive cortical and sub-cortical lesions in the supposed visual areas caused little or no visual disturbance. He quotes in all nine cases of extensive lesions of the mesial surface of the occipital lobe in which no hemianopsia was present. In Case 7 (Gowers, *Lancet*, 1879) a malignant tumour involved the region of the entire cuneus, upper and middle occipital convolutions, the region of the calcarine fissure and præcuneus, and yet there was no hemianopsia. On looking up the original account of this case in the *Lancet* the reviewer finds, however, that apparently Gowers did not see the patient for some months before death. No defect of vision was noted by the patient or his friends, but such evidence is of very uncertain value.

Commenting on these negative cases which do so much to disturb existing theories, Wehrli observes:—

1. Whether a softening of the occipital lobe will cause a hemianopsia or not depends rather on the number of intact fibres connecting the cortex with the primary optic centres than on the position of the softening in the cortex.

2. The optic fibres, relatively few in number, and mixed with association and commissural fibres, are dispersed in fan-like fashion to the occipital cortex. Few come to any one convolution, and their disconnection, in the case of small defects, is not sufficient to cause a scotoma.

3. That the function of the destroyed projection fibres of the corona radiata in cases of extensive cortical softening, and in cases where there is destruction of part of the optic radiations, is taken over by the adjoining fibres and cortical areas, the connection of which with the primary optic centres has remained intact. Countless experiments and a large number of clinical facts support this view.

4. That the existence of any sharp projection of the retina on the cerebral cortex (reproduction of the retina on the cortex in other words) is most improbable.

All conclusions based on the supposed existence of pure cortical lesions are valueless, as no case of a purely cortical lesion with hemianopsia has ever been met with.

With regard to the question of the limitation of the visual area in the cortex, Wehrli is not inclined to lay any great stress on the peculiarities of histological structure especially noticeable in an area round the calcarine fissure. He instances von Monakow's experiments on animals as pointing to a wide area of distribution for the visual fibres. In addition to the mesial surface of the occipital lobe von Monakow would include in the visual area parts of the convexity, the gyrus occipitalis and probably the hinder part of the gyrus angularis. In man he would include the whole of the occipital lobe and the hinder part of the gyrus angularis in the cortical area concerned with vision. This does not necessarily mean that vision is represented over the whole of this area in an equal degree. The very frequent occurrence of hemianopsia in lesions of the mesial surface of the occipital lobe is explained by the anatomical and circulatory conditions present which render the optic radiations more vulnerable to lesions in this situation.

The cortical representation of the macula lutea is next considered. Wehrli attacks the views of those who would locate the function of the macula in a definite small area of cortex on the floor of the calcarine fissure. The fact that central vision is almost always retained in cases of double hemianopsia is very difficult to explain on the theory of a definite small centre representing the macula. Wehrli also points out, apparently with justice, that direct vision of an object brings into play such an enormous number of associated cerebral areas, *e.g.*, judgements of the taste, smell, uses and general properties of the object looked at, that were the macula represented by a limited area of the cortex it would require a larger area than that required to represent the peripheral parts of the retina. He compares a restricted and narrow cortical localisation of the macular function to an attempt to put the Berlin Central Telegraph Office and connecting stations into a match-box. He would support v. Monakow's view that fibres connected with the macular function spread themselves over the whole visual area. This, he thinks, is a wise provision of nature to guard central vision from injury.

With regard to the question of the projection of the retina as a whole on the occipital cortex, Wehrli naturally disbelieves

in the existence of any correspondence between segments of the retina and definitely grouped cortical areas. The mapping out of areas to represent retinal quadrants as done by Henschen is, in his opinion, quite fanciful. The positive cases make the theory of quadrant representation very enticing, but it falls to the ground under the weight of evidence from negative cases. Experiments of Hitzig have shown that in the dog there is no evidence of reproduction of definite retinal areas in separate areas of the occipital cortex.

The last part of the article deals with the question of restoration of function after occipital lesions. Hitzig has shown experimentally that defects in the visual field caused by partial destruction of the occipital cortex are not permanent. In man, in cases of double hemianopsia, we get first complete blindness, but this is almost invariably followed, after a longer or shorter interval, by restoration of function, more or less complete. In the cases in which no return of vision, central or peripheral, took place, it will be found that the lesions were usually of the most extensive and severe type and the brain as a whole so gravely damaged that the patient lived only a short time after the blindness came on.

In the process of restoration of the visual fields central vision is much more often restored than is the peripheral field. This is taken by Wehrli to indicate that any intact neurons are, as it were, pressed into service in order to carry on the macular function. This restoration of vision with the macula is favoured by the great number of associated fibres connecting the macula, as represented in the cortex, with other cerebral centres.

The failure of restoration of vision in Wehrli's patient is ascribed not to severity of the lesions (which were indeed very similar to those found in cases of double hemianopsia with preservation of good macular vision), but rather to the very bad state of the patient's circulation and the degenerative changes in the cerebral vessels.

The symptoms of mind blindness which the patient showed might be associated with a lesion of the fasciculus longitudinalis inferior and the tapetum. Wehrli, however, thinks that this symptom depends largely on the general condition of the patient and on the state of nutrition of the brain tissue. The same holds good for the explanation of disturbances in orientation.

In his concluding sentences Wehrli claims to have shown that

purely cortical lesions associated with hemianopsia has so far never been observed. Conclusions regarding the narrow localisation of the cortical visual area, and the island-like representation of the macula in the cortex, based on the supposed occurrence of such lesions do not therefore rest on any firm foundation of fact.

The article is amplified by a large series of plates illustrating the lesions in the present case and in a large number of important cases published by various observers.

J. V. PATERSON.

GOULD (Philadelphia). *Biographic Clinics*, Vol. iii. London: Rebman Ltd.

THE third volume of Gould's *Biographic Clinics* differs considerably from its predecessors, except in the part which deals with the life-histories of Taine and of Symonds, in which the style is much as in previous volumes. The other chapters deal with more general matters, such as the History and Etiology of Migraine, the Scoliosis of School Children, etc. Dr. Gould is always interesting, even when he is not convincing, and all his writing is permeated with that firm conviction that he is in the right which a man must possess in some degree if he is to do any good in the world. The earnestness of his convictions, however, sometimes leads him into a style of writing which is far from polite or conciliatory to those who have not "found salvation" in his gospel of the cause of all evils, and the author is apt thus to spoil some of his valuable work. This arises, we are well aware, from the strength of his convictions, which are to be respected; he would make a larger number of converts if he were less denunciatory, for all that.

Migraine is, in his opinion, one need hardly say, a reflex caused by error of refraction; he brushes aside all suggestion of other causes which such phrases as "There is no causal relation between the sexual history and organs and migraine." The present reviewer has, he is glad to say, been able to cure many sufferers from migraine by correction of the refraction, as every other ophthalmic surgeon has, but he is unable to see any justification for the view, apparently held by the author, that all such cases are due to one cause alone. Is such a thing true in any department of medicine? He entirely agrees with Gould in thinking it a pity that in many more cases the

attempt is not made to secure relief in this way, but that does not hinder him from believing that in some cases the cause must be sought elsewhere.

Two papers deal with the subjects, closely allied to one another, of scoliosis in school children and the cause of slanted hand-writing, in which Gould developes his views as to the dominant eye; he thinks that a certain position is adopted in order to secure for the (usually) right eye a clear view of the writing point. Here, again, he drives his arguments home with much vigour and earnestness, for he is thoroughly in earnest, and some of his points are good. His idea is that eye, hand, foot even, are so correlated that the person is dextrocular, dextro-manual, etc., and of course his speech centre is also on the same (left) side of the brain that he may be as fully equipped as possible and have no unnecessary waste of energy in the struggle of life. Some of his arguments, however, seem to us to weaken his case. "The right-handed person, in playing the violin, violoncello, etc., is forced to use the left hand for the more expert task because he thus sees the fingers and neck of the instrument without fore-shortening, and better than he could if the fingering were done with the right hand." Three considerations might, however, be pointed out to our author regarding this matter. If a person, say a sinistrocular person, wished to play the violin left-handed, he would have to get an instrument specially arranged for him, and he could find no one to teach him; once he has learned the orthodox method he is not very likely to change, be he dextromanual or sinistro-manual. A violinist might possibly manage to look at music and fingers alternately, for they are not far apart at times; for a 'cellist this would be an absolutely impossible feat, and if he played the double bass he would require to be an acrobat as well. Dr. Gould has, in fact, missed the obvious fact that the musician's eyes are on his paper, not on his instrument at all; what a vile gut-scraper he would be if this were not so! Lastly, even in the case of the violin, but still more in the case of the 'cello and double bass, there are very few persons indeed whose left hands could perform the severe muscular labour involved in the use of the bow. The author has here missed the truth in his own eagerness to find it.

He discusses also the reason for slanted hand-writing, and attributes it, in part at least, to the necessity for having the writing in full view of the right eye as the work progresses:

he considers that the ideal position for the paper is opposite the right shoulder. Is there not another reason also, viz., that when we write we wish to do so with the minimum effort? We thus form the letters by means of an instrument—the hand holding the pen—whose fulcrum is the wrist, which lies on the paper below and to the right side of the writing point. The inclination of the letters is explained by the fact that each is an arc of the circle whose radius is thus indicated, and thus the maximum of work is performed in the minimum of time and with the minimum of labour. He mentions himself that the sloping of writing came in with commerce: this does not make it a degeneration from the erect form used by the old copyists and by printers and typewriters of to-day, as the author appears to consider—it is rather an adaptation for speed. There are many interesting and suggestive points in Gould's third volume to which we should gladly have referred had there been opportunity; it will well repay perusal.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Meeting March 8th, 1906.

The President, Mr. PRIESTLEY SMITH, in the Chair.

CASES.

A Case of Coralliform Cataract.—Mr. Sydney Stephenson.

This was the case of a man, aged 36, who had been the subject of "lamellar cataract," and when 12 years of age, was operated on, an optical iridectomy being performed in each eye.

The opacity occupies nearly the whole of the dilated pupillary area, is of a blue-grey colour, and shows the so-called "coralliform" variety, being made up "of innumerable tiny tubes of which some project from the equator and some from the anterior surface of the mass." Family history unimportant.

R.V. = $\frac{6}{18}$ and J 10. L.V. = $\frac{6}{18}$ and J. 10.

R.E. + 0.5 cyl. axis 90°. L.E. $\frac{+1.5 \text{ sph.}}{+1.5 \text{ cyl. axis } 90^\circ}$.

Unusual Congenital Opacities in both Lenses.—Mr. A. Levy.

Ethel P., aged 16, attended Royal London Ophthalmic Hospital, complaining of bad vision, which is gradually getting worse.

R.V. $\frac{6}{24}$, no improvement.

L.V. $\frac{5}{60}$:c-3.5 sph. = $\frac{6}{24}$.

On dilating the pupils a yellowish, granular opacity, 3 m.m. in diameter, is seen in each lens occupying the position of the nucleus or immediately behind it. Family history unimportant.

An Improved Method of Mounting Eye Specimens in Formalin Solution.
Mr. Priestley Smith.

Bottles containing mounted specimens were shown illustrating the method described by Mr. Priestley Smith in the *Ophthalmic Review* of March, 1906, p. 65.

Congenital Defect in Each Lens.—Mr. Charles Blair.

A girl, aged 14, shows, on dilatation of the pupils, a defect in each lens, the upper third of the circumference being absent in both eyes; the rest of the lens is clear and the fundus perfectly normal. A few strands of suspensory ligament are seen attached to the lens at the defective area by two small spurs in the right eye, and by one spur in the left. Family history unimportant.

$$\text{R.V. } \frac{6}{60} \text{ c } \frac{+3 \text{ sph.}}{-5 \text{ cyl.}} \text{ axis } 5^{\circ} = \frac{6}{24}.$$

$$\text{L.V. } \frac{6}{60} \text{ c } \frac{+2 \text{ sph.}}{-5 \text{ cyl.}} \text{ axis } 15^{\circ} = \frac{6}{9}.$$

Spurious Optic Neuritis.—Mr. E. W. Brewerton.

M.R., aged 9 years, has been under observation at intervals for the last 16 months. There is no defect of vision, no vomiting, and no headaches. Both discs show about 1 m.m. of swelling. The vessels, which are perfectly normal, curve sharply as they pass from the disc, but they are never obscured in any part of their course.

The condition has continued to show no change.

Unusual Arrangement of Retinal Vessels.—Mr. E. W. Brewerton.

W.T., aged 18, has a normal right eye, but the left fundus exhibits a peculiar arrangement of the vessels proceeding from the optic disc. The arteries and veins, which are somewhat difficult to differentiate from one another, emerge all round close to the margin of the disc which shows a shallow cup. The macula is displaced inwards.

$$\text{L.V. c. } -0.5 \text{ sph.} = \frac{6}{9}.$$

Non-traumatic Dislocation of the Right Lachrymal Gland.—Mr. Eric L. Pritchard.

Mrs. R. gives a history of having noticed a swelling above the right eye after a severe fit of crying lasting without cessation (!) for 24 hrs.

In the usual situation of the lachrymal gland is felt a lobulated mass which is freely movable, frequently disappearing into the orbit for

several days; but it can often be made to appear by the patient looking well downwards.

The swelling was thought to be hypertrophied lachrymal gland.

Two Cases of Peculiar Condition of the Fundus.—Mr. R. W. Doyne.

Both these cases showed similar conditions, viz. : an extensive development of fibrous tissue either in or behind the retina. It occupies a large portion of the temporal and upper portion of the fundus, and is of varying thickness, being seen with a +6 to +10 D. The fibrous tissue proceeds from the disc, and stretching outwards sometimes conceals the vessels which in other parts are clearly visible in front. In one case there are, in addition, some highly refractile bodies, which are situated somewhat in front of the connective tissue, while in the other there are some outlying patches of choroiditis. In one of the cases there is a history of a blow 9 months ago.

Implantation Cyst of the Iris.—Mr. Charles Killick.

D.C., aged 3, injured his right eye in August, 1905, while playing with an old three-pronged fork. The wound made with the fork soon got well under simple treatment. Six months later he was brought to the Kent County Ophthalmic Hospital with the history that for "six weeks previously a white spot had been growing on the right eye."

On examination a small scar is seen about the centre of the cornea. At the upper part of the iris at its free border is a small pearl-like tumour from which a dark coloured hair arises, and after crossing the anterior chamber, is lost in the angle at the inner side. On dilatation of the pupil a faint opacity of the lens capsule is visible just below the level of the corneal scar.

"Kornoscope."—Mr. J. H. Tomlinson.

This is a triplet lens having a spherical "focal plane" by means of which the whole surface of the cornea is in focus at one time.

PAPER.

A Scotometer for the Diagnosis of Glaucoma, and other purposes.—Mr. Priestley Smith.

This instrument was designed by Mr. Priestley Smith to facilitate the examination of the central parts of the fields of vision, especially in cases of suspected glaucoma. Sixteen years ago, Bjerrum pointed out that the defect in chronic glaucoma is not so essentially peripheral as has been supposed, but that it is traceable in sector-like form to the blind spot; and with this object in view Mr. Arthur Sinclair read a paper before the Ophthalmological Society in 1905, in which he lays

stress on recording at any one time a complete circular sweep of the field rather than using the ordinary meridional method.

The instrument consists of a disc made of millboard covered on one side with black cloth, a small white hole being left in the centre to serve as a fixation point; on the other side of the board at the circumference numbers are marked denoting the angles ($0-360^\circ$) corresponding to those on a perimeter chart, and which can be easily read by the surgeon standing in front of his patient. Situated on the black side is a faint radial line extending from the centre to the circumference, and on this are marked intervals corresponding to the 5° , 10° , 15° , 20° , and 25° circles on the perimeter chart; on this line is fixed the test object, which should be some material of a dark grey colour, a piece of wool 3 m.m. square being generally used as it readily sticks on the cloth. In contact with the circumference of the disc on the patient's left hand side is a wooden indicator placed horizontally and fixed on an arm behind the disc; stretching from this indicator to the centre of the disc is a thin dark cord which holds a sliding bead to be used in the manner described later. The whole arrangement is supported on a wooden stand easily kept in position below by the patient's feet, and above by a handle held up to the cheek just beneath the eye to be examined and attached by cords to the circumference of the disc.

All tests are started from the indicator on the left hand side in the case of both eyes by placing the test object at the mark on the line corresponding to the circle to be explored; then by rotating the disc the positions where the object disappears and reappears can be noted down by referring to the numbers on the back. The 25° circle is the usual one to explore in a suspected case, when if there is no dimness in the vision over this area we may conclude the absence of glaucoma. On the other hand, we can explore the 20° circle which passes outside the blind spot, the 15° circle which passes through it, and the 10° circle which runs clear of it on the inner side. We can also explore the region immediately around the blind spot by using the sliding bead alluded to above as the fixation point, and rotating the original fixation point round the new one. Thus, when the bead is fixed at 15° from the centre, the middle of the disc corresponds to the blind spot, and in this way any definite circle around it can be explored as desired. The results can be recorded as follows:—

Scotometer—3 m.m. grey.

25° circle—no defect.

or

25° circle—defect 30–120.

10° circle—no defect.

As a general rule these tests may be said to be perfectly reliable, for although some portions of the peripheral field may fail first, these earlier defects, being sector-like, can be detected in their initial stage by the circular method.

The Hereditary Influence in Myopia.—Mr. Claud Worth.

Mr. Worth investigated 687 cases in order to determine whether the severe complications frequently observed in myopia were more prevalent in those cases in which evidence of heredity is found. He divided this number into malignant and non-malignant, the former group including those which showed decidedly gross secondary changes in the fundus; and he found that 654 were of the non-malignant type and 33 of the malignant type. Again, out of the 654 non-malignant cases, 366 (or 56 per cent.) gave a history of myopia in parent, grand-parent, uncle or aunt, brother or sister; and of the 33 malignant cases only 8 (or 24·25 per cent. gave a history of heredity. Thus the hereditary influence is less marked in the malignant than in the non-malignant type. While conducting these investigations he elicited some additional points of interest. Four families showed a peculiar history, and one pedigree was especially striking; nearly all the males being myopic but no females being affected, and the myopia was transmitted through the female line; moreover the amount of myopia in each case was about the same (viz., 10—12 D), and all the myopic eyes had brown irides while those of the healthy eyes were blue. He also found that, although myopia is always more common in males than in females, the proportion of males is far greater where a family history is obtained than where there is none.

Pathological Report on a Case of Orbital Encephalocele associated with Microphthalmos, shown before the Society in 1905.—Messrs. J. Herbert Parsons and George Coats.

Mr. Parsons had shown the child to the Society when it was 13 weeks old. There were then large cyst-like masses in the right orbit, pushing the globe over to the outer side. The right eye was evidently microphthalmic and showed ophthalmoscopically a coloboma of the nerve entrance and also of the macula. Very various diagnoses were made as to the orbital condition. As the tumour was increasing in size it was operated on, but the child died a few days later. The mass in the right orbit consisted of brain tissue which pressed upon and deformed the globe. It was connected with a large mass of brain substance within the skull which lay beneath the frontal lobe. The intracranial mass had displaced the latter upwards and the temporo-sphenoidal lobe backwards, but had no connection whatever with either. It was therefore believed

to be either a teratological inclusion, or a piece of brain substance snared off in early fœtal life, possibly from the region of the caudate nucleus, and growing independently. The eye showed three deformities each of which was very rare. (1) An ectasia on the nasal side of the papilla which still had a lining of stretched choroid and normal retina. (2) A coloboma of the nerve entrance which was peculiar in being on the temporal side of the nerve and in being entirely within the area of the porus opticus. (3) A macular coloboma which consisted chiefly in a partial defect and depigmentation of the pigment epithelium, both the choroid and the retina being almost intact. The relation between the encephalocele and the abnormalities of the globe was discussed.

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DERMOIDS OF THE ORBIT.*

By W. B. INGLIS POLLOCK, M.D., *Pathologist and
Bacteriologist to the Glasgow Eye Infirmary.*

DERMOIDS of the orbit are not so common that a case is without interest to the members of the Society, and I wish at the same time to discuss several questions in association with this case.

The patient was a boy, E. C., of 12 years of age, who was admitted to the Eye Infirmary, Glasgow, on the 8th March, 1904. He was well developed for his age, and the visual acuteness of both eyes equalled $\frac{20}{20}$. A small swelling, the size of a large bean, was felt in the anterior part of the left orbit in its upper and outer quadrant. It had been present since infancy. The skin was freely movable over it, whilst it did not seem to be attached to deeper structures. It was of firm, elastic consistence and did not interfere with the movements of the eyelid, although it was slightly prominent. There had never been any pain or tenderness.

Upon the 9th March, 1904, I removed the growth, carefully dissecting it out entire. It was subjacent to the levator muscles of the eyelid, and was not attached to the periosteum. The wound healed by first intention, and the patient was dismissed five days later.

The cyst was fixed in formalin and embedded in celloidin. While cutting the sections a number of loose hairs escaped. Upon microscopical examination the cyst was found to be a typical dermoid of slightly oval shape, measuring on the microscopic slides 8×9.5 m.m. The

* Read at a meeting of the Glasgow Medico-chirurgical Society on the 2nd March, 1906.

wall is composed of fibrous tissue, which in a little over one-third of the circumference contains numerous hair-follicles and sebaceous glands. On a few sections one or two small sweat glands are seen. At this part there are a few papillæ, and the epithelium closely resembles epidermis. In the remainder of the circumference the lining membrane is composed of granulation tissue with numerous giant cells. Small fragments of hairs are present in this granulation tissue, and giant cells (of the foreign body type) are noticed around them (Fig. 1). At one of the points of junction the granulation tissue appears to be undermining the epithelium (Fig. 2), while at the other it seems to be splitting up, not only the epithelium, but also some of the underlying fibrous strands into different layers, as if gradually infiltrating these tissues. It does not show any tendency to grow into the cavity of the cyst. The contents are mainly sebaceous material, with a few cells, and a number of loose hairs. No evidence of cholesterol crystals is noticed. Neither bone nor teeth are present.

True dermoids of the orbit are always congenital. They may grow after birth, sometimes increasing more rapidly at puberty. They occur in three well-recognised situations. The most frequent is at the upper and outer angle of the orbit as in my case; they rarely exceed the size of a small grape. They lie either in the orbit, or outside of it, about the level of or slightly below the eyebrow. These par-orbital cysts may reach the temple. Much less frequently dermoid cysts are found at the upper and inner angle of the orbit, often of larger size than the former group. They may extend deeply into the orbit and may even perforate the bone and be connected with the dura mater by a pedicle. The third situation is in the upper eyelid un-

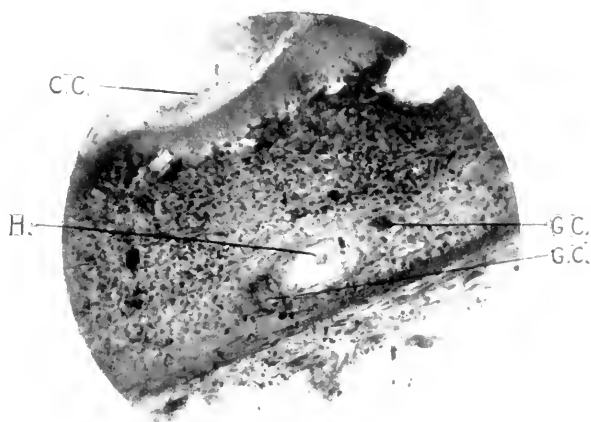


FIGURE 1.

A portion of a hair (H) is lying deep in the granulation tissue of which the cyst wall is composed at this part. It is surrounded by two giant-cells (G.C.). The cyst contents (C.C.) are seen in the upper part of the figure.



FIGURE 2.

The junction of the granulation tissue (G.T.) with the epithelium (E.P.) which elsewhere lines the cyst. A portion of a sebaceous gland (S.G.) is seen under the epithelium. Note how the granulation tissue is invading and destroying the epithelium.

connected with periosteum. Bland Sutton¹ believes that such arise in the fissure between the fronto-nasal plate and the cutaneous fold from which the eyelid is formed. This fissure may persist as a coloboma of the lid. Other authors, however, are of opinion that dermoids of the lids have grown forward from the orbit. Dermoids of the conjunctiva, cornea, or iris are not included in this paper.

While dermoids remain small they seldom give rise to pain or cause inconvenience apart from any disfigurement. The skin is always freely movable, but the cysts may be attached to deeper structures. Such are the adhesions to muscles, nerves, or periosteum. Some of these may be congenital, *e.g.*, the hollowing out of the bone or adhesion to the dura mater. The others are probably inflammatory from pressure effects. The cysts are most frequently opaque, but may be translucent when the contents are oily or serous.

Histologically dermoids are characterised by a cyst-wall resembling the skin, with a lining membrane simulating epidermis, and under it hair-follicles and glands. Mitvalsky² arranges dermoids into three classes according to the structures in the walls: (1) with hair-follicles, sebaceous and sweat glands; (2) with sweat glands; (3) with simple epithelium and no hair follicles or glands. It is very doubtful if the last group are really dermoids. My own opinion is that there must be a careful survey of serial sections before declaring that the cyst has not originated from a gland of which only the atrophied remnants are to be found in the walls. Quite recently in examining a serous cyst which I removed from the conjunctiva of a patient, I found only that forty or fifty sections exhibited the gland from which the cyst had arisen.

The elements in the cyst wall may all be more or less

fully developed. With the distension of the cyst a gradual thinning of the epithelium takes place, and a degeneration of the hair-follicles and glands sets in, so that at spots there is only a fibrous capsule and a single or double row of epithelial cells lining it. Blockage of the ducts of the glands may produce small cysts in the cyst wall itself. More common is an inflammatory change with the appearance of granulation tissue, which lines the cyst wall and displaces the epithelium, as seen in my case. It may completely surround the cavity, or grow inwards filling the cyst. The granulation tissue is characterised by the excessive formation of giant cells of the foreign body type, and by the slight tendency to organization. This sometimes occurs, and then bone-formation may be seen. This is a degeneration process, and is distinct from the bone or tooth formation of congenital origin. Parsons³ believes that the presence of bone or teeth indicates a teratoid cyst. But I have a specimen from Professor Wintersteiner, of Vienna, with bone in fibrous tissue lying within the cyst, which also contained chalk deposits. The usual contents of dermoid cysts are granular débris, sebaceous material, or sweat secretion, and cells. Cast-off hairs may be more or less numerous. The cellular elements or the oily material may predominate.

The origin of the granulation tissue and of the giant cells has been much discussed. Mitvalsky² suggested that the over-distension of the cyst caused loss of epithelium, and as a result granulation tissue replaced it. But such a factor should operate in all cysts, and that is not the case. I have seen granulation tissue in ranula of the tongue, and also in inclusion cysts, but in many different kinds of cysts distension leads to thinning of the epithelial

clothing which may ultimately be represented by a single layer of flattened cells like endothelium, and granulation tissue never appears. It seems to me that there must be some irritant in the secretions within the dermoids which induces this proliferation of granulation tissue, as it has been very frequently reported. A bacterial origin can apparently be dismissed. At least in my case it took twelve years for granulation tissue to surround two-thirds of the cyst. The irritant must therefore be slow-acting and persistent in nature. We know now that other irritants besides the tubercle bacillus produce giant cells. These are especially foreign bodies, silk stitches, hairs of caterpillars in the iris, and, of course, syphilis. Tuberculosis and syphilis may be both excluded by the absence of caseation or necrosis and the history of the cases. Patients are very prone to rub and handle such growths in the hope that they may disappear. Massage, however, drives the contents into the surrounding tissues. Some have suggested that the hairs are thus driven into the epithelium (see later). The cause is more likely in the constituents of the glandular secretions. This slow-acting irritant—whether chemical or bacterial—has a different effect from pyogenic organisms. It calls forth a granulation tissue rich in giant cells and with very slight tendency to organization. The process, once started, tends to continue.

Ginsberg⁴ explains the occurrence of the giant cells by the supposition that fragments of loose hairs have become displaced from their point of origin in the lining membrane. In proof of this he mentions that portions of hairs are occasionally seen lying parallel to the surface, and that as that is not a normal direction, they must have been displaced or thrown off from the hair-follicles. He gives

an illustration showing two fragments of hairs partly enclosed in giant cells.

This reasoning is not sufficient. Hair-follicles are sometimes very nearly if not quite parallel to the surface. The sequence of events seems to be rather different. The granulation tissue has appeared as the result of chemical and mechanical irritation. It gradually absorbs or displaces the other structures within the fibrous capsule. The hairs are the most resistant to this process, and consequently are the last to disappear, and may be still present surrounded by giant cells, although the hair-follicles, glands, and epithelium have all disappeared.

The source of dermoid cysts of the orbit has also been the subject of discussion. The first theory was advanced by Leber, who supposed that under the influence of disturbed nutrition the normal tissues produced other tissues. The theory which is now generally accepted is that of sequestration dermoids. Small invaginations of skin are left during the process of closure of clefts in foetal life. This theory satisfactorily accounts for the union with periosteum or bone, and even through openings in the bone with the dura mater. The theory of diplogenesis has also been brought forward, but it is unnecessary for most cases. Where bone and teeth are present then there is more doubt. Weigert reported, in 1876, a large multilocular cyst projecting from the orbit of an infant who died a few days after birth. It contained cartilage, bone, muscle, epithelium suggestive of the bronchi, and various glandular tissues. He called it a teratoma of the orbit, and there is little doubt that the case was one of diplogenesis.

With regard to diagnosis the occurrence of a small growth which has been present since infancy at once

suggests a dermoid. But we ought always to remember the possibility of meningoceles of the orbit, which are most frequent at the upper and inner angle. In operating the most careful aseptic precautions must therefore be taken. The most important diagnostic sign is the pulsation synchronous with the brain. But such may be communicated to a dermoid in contact with the dura mater. The attachment to bone of a meningocele may also occur in the dermoid. The collapse of the former under pressure and refilling may be difficult to obtain. Sometimes exploratory puncture may be necessary in order to reach a certain diagnosis.

The treatment is excision. The cysts should be removed without puncture, as escape of the contents is said to lead to recurrence.

I have to thank Dr. Fergus for permission to operate on the case, and also to publish it. My thanks are also due to Professor Muir, who very kindly permitted me to work in the Bacteriological Laboratory of the University, and has given me advice on different occasions. The expenses of apparatus and materials have been borne by a grant from the Carnegie Trustees.

1. Bland Sutton. *Tumours Innocent and Malignant*, 1903, 3rd edition.
 2. Mitvalsky. *Archiv für Augenheilk*, 1891, vol. xxxiii.
 3. Parsons. *The Pathology of the Eye*, 1905, vol. ii. Also for references.
 4. Ginsberg. *Grundriss der Pathologischen Histologie des Auges* 1903.
 5. Weigert. *Virchow's Archiv*, 1876, vol. lxxvii.
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REVIEWS.

TH. AXENFELD (Freiburg). **Serum-therapy in Ophthalmology.**
1905.

THE numerous bacteriological investigations which have been published during the last decade have resulted in more or less successful attempts to deal with eye diseases by the injection of antitoxins.

The earliest and best known of these attempts is the antitoxin treatment of diphtheria. Although the mild character of the disease when restricted to the conjunctiva and the frequency of mixed infection in severe cases render exact conclusions difficult, there is an almost unanimous verdict in favour of the good effects of the antitoxin in diphtheritic ophthalmia. Axenfeld shares this opinion; but observes that the effect upon corneal complications (infiltrates and ulcers) is only trifling. This is to be accounted for by the fact that corneal complications are mostly mixed infections. Some, indeed, go so far as to assert that the diphtheria-bacillus has no direct toxic action on the cornea, but this is very doubtful. The serum treatment should be used in all cases, for every case is dangerous to others, and one cannot tell of any case whether it is going to be mild or severe.

As regards pneumococcus infection, serum-therapy has not made so much advance even since Roemer's well-known work, probably in consequence of the good results obtained by galvano-cautery and paracentesis. The treatment is still in the experimental stage, and various are the views adopted as to the action of the serum. Axenfeld inclines to the "aggressin" theory. This is based upon the observation that the injection of exudate from which all bacteria have been removed renders the organism much more susceptible to the poison of the bacilli, while a continued injection of small doses of the same substance results in a high degree of immunity. This is supposed to be effected by piling up in the organism what is termed "antiaggressin." It is only in corneal lesions that serum treatment is indicated. The conjunctival and lachrymal affections due to pneumococcus are in this connection unimportant.

Axenfeld publishes 185 cases of "sulcus serpens" with pneumococcus infection treated by serum-therapy. The conclusion to be drawn from these statistics is certainly favourable to the treatment, though the results can hardly be expressed in percentages. The cases are divided into those treated during the early stages and the later, and further according to the line of treatment adopted.

The first table contains 21 cases of cures in Stage 1, treated by "passive immunity," that is, by subcutaneous or intra-muscular injection of anti-pneumococcus serum, the dose being 10 cubic centimeters. Table B contains 20 cases where similar treatment failed, being also first stage cases. Table C records 16 first stage cases treated with 20 or more cubic centimeters, of which 7 were cured, and 9 uncured. Table D contains 9 second stage cases, all cured by 10 centimeters, and Table E 29 cases of second stage similarly treated by "passive immunity" and uncured. Table F records 23 cases of second stage also treated "passively" by 20 or more cubic centimeters of serum, of which 6 were cured, and 17 uncured. Table Fa shows 28 cases seen at various stages in which either galvano-cautery or paracentesis was employed in addition to the serum injections.

Table G contains 37 cases in which the simultaneous treatment by both passive and "active" immunisation was employed, the "active" immunisation being effected by injections of dead cultures of the micro-organisms in question. In this simultaneous method it is best to inject the culture intra-muscularly and the serum subcutaneously, which gives the former a chance of more rapid entrance into the circulation.

The question of post-operative pneumococcus infection is touched upon. This is, as is well known, the operator's most fatal enemy. Axenfeld has tried prophylactic immunisation in 12 cases, with the result of but one wound infection, which was due, not to pneumococcus, but to staphylococcus aureus. After wound infection (due to pneumococcus) has already broken out Axenfeld finds serum treatment ineffective. He is inclined to attribute this to the fact that the vitreous partakes only very sparingly of the immunity produced so largely in other tissues of the organism.

As regards serum-therapy in ophthalmic practice for cases

of streptococcus and staphylococcus infection there is as yet not much to record.

That there is a future for serum-therapy in ophthalmic practice is most probable, but the effect produced upon the reader of Axenfeld's most interesting monograph is that, with the possible exception of diphtheria, the whole matter is still altogether in the purely experimental stage.

J. B. S.

E. H. OPPENHEIMER (Berlin). **Technology of Spectacles.**
Section of the *Graefe-Saemisch Handbuch der Gesamten Augenheilkunde*.

A WORK of ninety-six pages, crowded with the multitudinous minutiae of fitting glasses to the human face. The work has nothing to do with the estimation and diagnosis of errors of refraction; it is confined to the technical details of the products of the optician's workshop. The quality and density of glass, the curvature, size and centering of lenses, the shapes of frames and the materials employed in their construction, "sides," "rims," "hinges" and "bridges"—all are detailed. "Dodges" of this and that optician for producing a frame that should hold securely to the human face and yet nowhere press or pinch it, are all tabulated in a most conscientious and laborious fashion. Yet, withal, the author is not without some sense of humour; he gives in footnotes polyglott synonyms for the various objects described. Under "Das Monocle" we find "English: *monocle (single eye-glass) quizzing glass*, Oxford; in America, where it is very uncommon, it is sometimes called *dude's glass*."

There is no doubt it is an admirable compendium of useful and interesting information, but the examination of the book leaves two impressions on the mind:—First, that the patterns of spectacles most favoured by German makers are much more ungainly than those favoured by English, French and American makers; and, secondly, that the technical data of this sort is much more conveniently obtained by the examination of the goods in some wholesale dealer's showrooms and of his and others' factors' catalogues.

N. BISHOP HARMAN.

ZUR NEDDEN (Bonn). **Bacteriological Examination of the Blood in Sympathetic Ophthalmia and other forms of Iridochoroiditis.** *Archiv für Ophthalmologie*, lxii., 2.

SYMPATHETIC ophthalmia is a disease which, from its great frequency in the past and the deplorable results with which it has so often been attended, has naturally attracted much attention; but although no end of work, both bacteriological and experimental, has been done, it has baffled the most patient research to find out its cause. Several theories have been propounded and various facts adduced to support them, but none of them have proved satisfactory enough to find general acceptance. Still more and more light is being steadily shed on this subject, and Zur Nedden here gives a report of a most painstaking research in this direction. He is an advocate of the metastatic theory, according to which the infection travels from the exciting to the sympathising eye by way of the circulation, and it occurred to him to make experiments with the blood of patients suffering from this disease by injecting it into the vitreous of rabbits' eyes. His work was based on the following considerations: If sympathetic inflammation is a metastasis, then the infective organism must be present for some time in the blood, and if blood is abstracted at a favourable time and injected into a rabbit's vitreous, it should set up there a progressive inflammation similar to that which Schirmer had obtained after the implantation of small pieces of tissue taken from an exciting and sympathising eye. Now, the normal blood, as is well known, has a certain bactericidal action, and it may be assumed that this action must be deficient in this case, and, as a consequence, the organisms would be able to proliferate in the circulation. The question as to what would be the most favourable time clinically to find the greatest number of them in the blood presented a difficulty, for although they must be in the blood before the appearance of any clinical signs of sympathetic inflammation, it is impossible to determine the length of the incubation period, or to say beforehand whether an injured eye will readily set up this disease or not. The author chose rather to test the blood within some weeks after the onset of the symptoms, while its bacteriolytic power was still low, for this latter would increase with the further continuance of the inflamma-

tion, and by the formation of anti-bodies destroy the organisms still present in the circulation. The obstinate character of the inflammation and the exacerbations frequently seen in the course of it suggested to him that the bacteria remain for a long time in the blood, and that fresh infection may be carried to the eye, from which again organisms may possibly escape back into the blood.

His method of experiment was as follows:—About 20—30 c.c. were drawn off by means of a Heurteloup's leech and allowed to stand for half an hour in a glass vessel; part of this was drawn up into a syringe from the bottom of the glass and injected into the vitreous after paracentesis of the cornea in order to get as much in as possible. This method was afterwards so modified that he injected part of the newly drawn blood (abstracted sometimes with the Heurteloup, at others from a vein in the arm) at once; part of it was passed through a Berkefeld filter and then injected, while another portion he subjected to a heat of 58° — 60° C. for three-quarters of an hour before use. The strictest precautions to ensure asepsis and avoid error were taken throughout.

Blood was taken in this way from three patients who developed sympathetic ophthalmia, and in two of these Zur Nedden succeeded (twice out of 11 experiments in the first, and once out of 10 in the second) in producing a severe plastic inflammation in the vitreous by means of the *heated* blood only (once with the blood that was allowed to stand); and this exudation from the vitreous, both with and without similar heating, set up an inflammation on being injected into a second rabbit's eye. All kinds of media were employed to cultivate the bacteria from the blood, and every method used to detect any such microscopically in the tissues, but without result. He concluded that the bacteria which set up this inflammation were too large to pass through a filter, they were very resistant to heat, and did not produce toxins.

The exudation from the infected rabbits' vitreous was regularly examined for organisms; but it was not until Zur Nedden had transferred the infection from rabbit to rabbit for the fourth time (in case 2) that he found very small bacilli resembling the pseudo-diphtheritic bacillus in the vitreous and cultivated them. Numerous inoculation experiments were then made with these bacilli, as a result of which he found that this bacillus has the property of setting up in rabbits a

plastic iridochoroiditis by way of the circulation, and sometimes changes in the more important internal organs when they show any tendency to pathological processes.

Zur Nedden also repeated Schirmer's experiments of implanting pieces from various tissues (including the optic nerve) of the exciting eye into rabbits' eyes, but never obtained any marked results.

As regards his examination of the blood in other forms of iridochoroiditis it may be stated briefly that out of seven cases he obtained one positive result, viz., the staphylococcus albus, which on inoculation set up a plastic, not a suppurative, inflammation, although injection of the blood itself produces scarcely any effect.

Zur Nedden holds that his experiments at least support the metastatic theory of sympathetic ophthalmia, and although his discovery of this bacillus as the cause of this disease is, admittedly, not conclusive, his work is certainly commendable for its thoroughness.

THOS. SNOWBALL.

E. W. STEVENS (Denver). Fatal Septicæmia due to Ophthalmia Neonatorum. *Ophthalmic Record*, November, 1905.

OF the twenty cases heretofore published of ophthalmia neonatorum complicated by arthritis, two ended in death. A third fatal case is recorded by Stevens. The mother was suffering from gonorrhœa before confinement, the gonococcus having been found in the discharge. Purulent ophthalmia developed the second day after birth, the gonococcus being found in the discharge from the eyes. The ophthalmia was treated by the instillation, every three hours, of a 25 per cent. solution of argyrol, and the cleansing of the conjunctiva every hour with boris acid solution. The improvement in the ophthalmia was rapid and satisfactory. In twelve days the discharge of pus had ceased, the conjunctiva was smooth, and the corneæ clear. On the 13th day, when the ophthalmia was about well, the nurse noticed redness and swelling of the second metacarpal articulation of the ring finger of the baby's right hand. On the next day the right knee was reddened and swollen. The temperature was 101°F., and the patient restless and apparently suffering severe pain. Twenty-four hours later the left ankle joint became affected, and the right knee and

leg were much swollen. Temperature 103°F. The next day the little patient was much worse: temperature 104°F. The left elbow joint was swollen, and endocarditis had set in. The left ankle was incised to the periosteum and a small amount of thin pus liberated. This pus was microscopically examined and gonococci found. Coma and death of the patient occurred seventeen days after the beginning of the ophthalmia.

E. J.

J. ELLIS JENNINGS. **Colour Vision and Colour Blindness.**
Philadelphia: F. A. Davis Company, 1905.

THIS book of 144 pages, which has now reached its second edition, seems to be the best practical manual upon this subject yet offered to English readers. About one-fourth of the work is given to the consideration of physics and theories. The remainder deals with the observed clinical facts of colour blindness and practical methods for its detection. It is well illustrated, with a coloured plate explaining the Holmgren test, and twenty-seven figures scattered through the text. The present edition contains a chapter on Testing the Form and Light Sense, and the Rules for the Examination of the Sight and Hearing of Railroad Employes, endorsed by the American Medical Association.

E. J.

W. LOHMANN (Münich). **Commotio Retinæ.** *Archiv für Ophthalmologie*, lxii., 2.

CONTUSION of the retina ("Berlin's opacity") is characterised by a white opaque appearance of this membrane opposite the site of injury (sometimes with slight detachment), a temporary impairment of the central vision, a transient peripheral defect of the visual field, and a diminution of the light-sense which lasts for some days. This opacity is generally admitted to be due to œdema, although writers are not agreed as to the origin of this œdema. From experiments which Berlin made on rabbits he concluded that it was due to hæmorrhage between the sclerotic and the choroid producing serous infiltration and swelling over the area of opacity, particularly in the outer molecular layer of the retina, while Denig, who proved that this was not an essential factor, was of opinion that drops of fluid were forced out of the vitreous by the impact of the blow into the

retina. Lohmann's explanation is this: The various tunics of the eye are pressed inwards at the point where the blow strikes it, and in consequence drag upon the parts next to them; these again exert traction on the parts more remote from the point of injury, until the tissues opposite the latter are dragged in opposite directions. This traction being parallel to the surface of the retina is therefore exerted on the retinal elements at right angles to the direction of their arrangement and hence tends to loosen or tease out the retinal structure and separate its individual parts from each other. This separation of the retinal elements (*Discessus retinæ*), which is helped by the momentary rise in the intraocular pressure, Lohmann considers the essential factor in this condition. It is sufficient to cause the immediate loss of sight; the retinal vessels become temporarily paralysed by the blow, and if the retinal elements are sufficiently separated—this will occur opposite the site of injury where the traction is in opposite directions—serum is thrown out from the vessels into this part, and œdema results.

As regards rupture of the choroid, Hughes had held that it is caused by the sudden rotation of the globe by a tangential blow; this rotation being checked by the optic nerve the choroid is ruptured on that side which from the rotation was moving away from the optic nerve. Lohmann, however, rejects this theory for various reasons, and considers that the mechanism, detailed above for contusion of the retina, is also applicable to rupture of sclerotic and choroid, the differences in the results being due to the special anatomical structure or attachments of these tunics or the direction of the blow.

THOS. SNOWBALL.

M. S. MAYOU (London). **The Changes produced by Inflammation in the Conjunctiva.** (Hunterian Lectures, R. C. S., 1905.) London: John Bale, Sons and Danielsson Limited, 1905.

THIS is a book of 179 pages, printed in large, clear type and illustrated by coloured plates and numerous figures in the text. In it the writer records his results of more than three years' work on inflammation. He states in the preface that he has attempted to bring forward some views of the subject, derived from the study of the conjunctiva, which may

suggest a basis for further research. He has not attempted to treat of the whole subject, but has described the conditions which he has personally investigated.

In the first of the three lectures the following are the principal subjects:—Development of the conjunctiva; Changes in the epithelium during foetal life; Thickening of the epithelium dependent on separation of the eyelids; The conjunctiva in snakes; Manner and date of separation of the eyelids in the human embryo; The epithelium of the conjunctiva at birth; The change in the epithelium as the result of inflammation; Primary and secondary Xerosis; The sub-epithelial tissue and the cells found in it. Lecture 2 comprises—Experimental wounds of the bulbar conjunctiva in rabbits with a view of trying to determine the origin of some of the cells; The development of the lymphoid tissue and its significance; Follicular formations and their histology; The cells of the discharge in the various forms of conjunctivitis; The histology of Gonorrhoeal, Koch-Weeks, and Diplo-bacillary conjunctivitis.

Lecture 3 is devoted to Trachoma, Vernal Catarrh, and Phlyctenulae.

The descriptions of experiments and their results are given clearly and the subject matter of the book is written in a lucid manner, so that the reader is seldom, if ever, in doubt as to the writer's meaning. It may be noted that Mayou holds that the endothelial and perithelial cells play the most important part in the production of mononuclear leucocytes and plasma cells, and that they are also strongly phagocytic. Amongst other stains, he has used Pappenheim's plasma stain for showing the changes in the cells of the conjunctiva.

Bacteriology does not largely bulk in this work. In 30 children with typical signs of Koch-Weeks conjunctivitis, the bacillus was found 25 times. From these observations and the examination of a large number of cases by smear preparations, the writer believes that it is possible to say, almost with certainty, from the clinical condition whether a case is due to the Koch-Weeks bacillus or not. We should have liked to have had the figures also for the cases examined by smear preparations.

It is quite impossible to discuss here, in detail, the contents of this volume, which is one of much interest and scientific value.

C. G. COAKLEY, N.Y. **Obliteration of the Frontal Sinus: Manual of Diseases of the Nose and Throat.** Lea Brothers and Co., New York and Philadelphia, 1905.

DISEASE of the accessory sinuses is such an important cause of ocular and orbital disease, that it is impossible properly to treat the latter without some acquaintance with the latest advances in rhinology. Coakley's name is associated with a method of opening the frontal sinus with which the ophthalmic surgeon should be acquainted. He does not advise this particular method for all cases of suppuration of the sinus; some can be relieved by removing the anterior portion of the middle turbinate bone, opening freely adjoining cells of the ethmoid, if diseased, and irrigating the sinus regularly through a canula. If, however, the frontal sinus is large and irregular, suppuration persists or recurs. Coakley then resorts to this simple but radical operation: The incision through the soft parts is made through the middle of the unshaved eyebrow, from its nasal end to the external angular process of the orbit. This incision goes through the periosteum, which is pushed back either way as far as may be necessary. Blood vessels are tied and clamps removed before proceeding deeper. A groove is cut, with a chisel, parallel to the orbital arch, one-sixteenth of an inch above it and opening the frontal sinus. The anterior wall of the sinus is now removed with a gouge, from the groove upward as far as the sinus extends; so that the whole cavity, with all its recesses, is exposed. The mucous membrane of the cavity is then completely removed with looped curettes of the necessary shapes, including lastly the mucous lining of the naso-frontal duct. The ethmoidal cells adjoining the duct are opened, and if diseased curetted; so that one large opening is formed between the frontal sinus and the nose. Iodoform gauze, threaded on a probe, is passed through this opening, and out at the anterior nares. This is drawn back and forth to remove all traces of mucous membrane from the lower part of the duct. "It is important that no particle of mucous membrane be left within the frontal sinus, or any of its ramifications." The bare sinus is now packed from below upward with iodoform gauze, so fully as to separate the skin wound at the nasal extremity at least one half an inch, the temporal end of the wound being closed by one or two

sutures. The packing is removed at the end of six or eight days, and afterwards with intervals of three to five days. In two or three weeks granulations line the bony surface of the sinus, and by the fourth week obliterate the naso-frontal duct. The granulating wound is allowed to fill in until it becomes obliterated.

Coakley's book, which has now reached its third edition, treats in a very satisfactory manner the other important points in which rhinology comes into close relation with ophthalmology.

E. J.

SCRINI. **On the Use of Alkaloids in Oily Solutions.** Paris: Vigot Fières.

AT the outset it would be as well to state that the reviewer has had no personal experience of oily collyria, beyond the use of castor or olive oil in cases of lime injuries, burns, etc.

The objections to aqueous solutions of the salts of these alkaloids, according to Dr. Serini, are the difficulty of applying them to the eye, the considerable laceration and the spasm of the orbicularis caused by them, and, lastly, the inconvenience due to their readily becoming septic,—media for the growth of various microbes and fungi, together with the chemical changes which occur in them, *e.g.*, the formation of rubreserine in solutions of eserine.

On the other hand, the oily solutions of the alkaloids (not of their salts), are readily applied by an ordinary dropper or a glass spatula, they cause no laceration nor spasm of the orbicularis, and their action is more rapid, more energetic, and more prolonged than that of the watery solutions of their salts. They do not form good culture media.

In support of these statements Dr. Serini details various experiments on men and rabbits which certainly appear to bear out his views. And it may be noted as interesting that he found that the cornea did not become dry when an oily solution of cocaine was used. This he ascribed to the fact that the oil formed a protective layer over the cornea, whereas if the watery solution was used no such layer was formed and the epithelium, exposed to the air from lack of winking, became dry. The dryness of the cornea was not directly caused by the cocaine.

One is not exceedingly impressed when one finds that watery

solutions of cocaine take a minute or two longer to act than oily ones, and that the latter's effect may last ten minutes or so longer. But there can be no doubt but that oily solutions of the alkaloid eserine are far better borne by patients, and enable one to carry out a myotic treatment of glaucoma for long periods, without causing the well-known symptoms of conjunctival irritation almost invariably to be found if watery solutions of the salts of eserine be used. Indeed, according to various authorities, Terson, St. John Roosa, Panas, etc., the use of such solutions limits the field of surgical intervention in cases of chronic glaucoma.

The methods of preparing the solutions and the various kinds of oil—olive oil is perhaps the best—are described in detail. The book is an interesting contribution to ophthalmic therapeutics, and will repay perusal.

FRANK C. CRAWLEY.

VAN DUYSE and DE NOBELE (Ghent). **Protection of the Eye during Radiotherapy.** *Revue Générale d'Ophthalmologie*, xxv., 1.

NOWADAYS, when treatment by means of X-rays is so frequently employed in rodent ulcer, tuberculosis, lupus, and other morbid conditions of the face, it is necessary to secure adequate protection for the eyes from any possible evil results of such exposure. The favourite method is by means of a leaden shield, but the authors fear that those in common use are not sufficiently thick; if the lead used is really impervious to the rays it is also inconveniently thick and difficult to mould; when occlusion of the eyes is not complete the oblique or secondary rays are capable of finding their way between shield and skin, a danger which is increased by the fact that to prevent sparks flying between lead and skin these are often separated by a non-conducting layer. The researches of Birch-Hirschfeld and others have shown that both the anterior and the posterior parts of the globe are liable to injurious action by the X-rays, an effect which may not be manifest until some weeks have elapsed. When the affected part is the eyelid it is necessary, according to Birch-Hirschfeld, to interpose a metal plate between lid and eye, which can conveniently enough be accomplished by the use of a pair of entropion forceps. Exposures should be conducted with great care, should be of brief duration, and should not be repeated at too short intervals for fear of a cumulative action. Cocaine and adrenalin should

first be administered. If the treatment has to be applied to the conjunctival surface, the lid must be everted. Under such conditions the present authors consider it to be better not to employ such forceps but to protect the eye by means of shields applied directly to the eye in the conjunctival sac after administration of a local anæsthetic. But as these metallic shields are badly tolerated they have experimented with enamel substances fashioned like an artificial eye. They have experimented with various enamels containing metallic oxides, with a shield of lead and porcelain, with a special enamel called "Parisian" by the maker, and with a glass with a base of lead manufactured by a firm which has also turned out other impervious glasses. All these substances were tested by the authors in regard to their permeability to X-rays, by interposing them under suitable conditions between a Crookes' tube and a photographic plate, with the result that the first of them (the enamels with the metallic oxide base) were found to be much too pervious; the lead and porcelain arranged in layers was not sufficiently homogeneous and could not be relied upon; the lead glass made by Gundelach (Thuringia) was certainly better, but probably because it was not sufficiently thick, not altogether satisfactory. The best results undoubtedly were obtained from the "Paris enamel" shields, which proved to be quite impervious. The authors have therefore had shields constructed of this substance, closely resembling artificial eyes; one of these is slipped into the sac in front of any eye on which, on account of trachoma or other malady, the X-rays are about to be allowed to play. They are quite easily borne for all the time required for the exposure.

W. G. S.

E. JACKSON (Denver, U.S.A.). **Skiascopy.** Herrick Book and Stationery Co., Denver, Colorado, U.S.A., 1905.

OUR American Editor, Dr. Jackson, has now brought out the fourth edition of his book on Skiascopy, and there can be no doubt that it is one of the very best treatises on the subject. After a preliminary discussion of the best name of the text, which in this country is more usually spoken of as retinoscopy or the shadow test, he proceeds to explain the optical principles on which it depends, and the various appearances with the plane and with the concave mirror in the different conditions of refraction. Dr. Jackson's method is to find the point of reversal either directly or after the introduction of a convex

lens, and to ensure greater accuracy in so doing he alters the position of the actual source of light, bringing this under some conditions close up to the mirror. While admitting that that is one method, and perhaps a very good method, of applying the test, we are unable to accept the statement that it is superior to that which is more customary, at all events in this country. We think that it rather introduces elements of error, and certainly of inconvenience, and we do not admit that greater accuracy is ensured. A useful little chapter on Autoskiagraphy is appended. We would suggest that in a future edition the punctuation should be revised; in the present one it is in places so incorrect as actually to obscure the sense. The book should be studied by all who conscientiously employ retinoscopy as their trusted objective method of deciding the refraction.

CHAILLOUS. **A Case of Blindness without Ophthalmoscopic Changes and with the Pupil Reflex Retained.** *Recueil d'Ophthalmologie*, December, 1905.

THE patient who exhibited this unusual condition had presented himself to Babinski on account of epileptic attacks of several years' duration; as he was also almost completely blind Chaillous was asked to give his opinion on the case; he showed the patient at a recent meeting of the Paris Ophthalmological Society.

The patient was a lad of 16, who had been subject to epileptic attacks for some years, these seizures becoming more and more frequent. At each occasion the patient felt giddiness, turned pale, lost consciousness and fell down; he never micturated or bit his tongue; in about seven or eight minutes he recovered. In his history, personal or family, there was little of moment to be noted, save that at the age of $2\frac{1}{2}$ he was abruptly seized one night with an attack of fever with delirium and nausea without vomiting. A physician who was called in prescribed *santonin*. When he recovered from this attack the boy was found to be blind, and though he visited many ophthalmic surgeons he never obtained any vision again. The patient was a well-grown, robust, intelligent-looking lad; he was guided by his mother and was stated to be unable to guide himself except in places to which he was habituated. He walked almost always with head held up and the eyes well opened. Externally the eyes appeared normal, the pupils equal, medium in size, and reacting to light and consensually. He could see the hand at 0.5 metre, but was

unable to count fingers, and perceived no colours. One could trust but little to the results of the examination of the field on account of the constant movements of the eye, but so far as could be made out only the central region was preserved. The case was in fact one of blindness without ophthalmoscopic changes, the loss of sight not being, however, absolutely complete. That it was not one of hysterical blindness seems clear from the duration of the case, from the early occurrence of cerebral symptoms, the age at which the disease began, and the persistence of these symptoms. In short, the diagnosis was one of cortical blindness.

It is worthy of note that this patient had no knowledge of colours, though this power is often retained in such a lesion in the adult, but this Chaillous explains quite fairly by pointing to the early age at which the disease took its origin, namely, $2\frac{1}{2}$ years; few children have any real knowledge of colours by that time, and the power could not develop. So far as is known the patients, with the exception of the present one, who acquire cortical blindness only live a very short time indeed,—at all events the prognosis is bad. This is not to be wondered at, since the lesion is usually one of extensive cerebral thrombosis or softening; in this instance the only hypothesis which could explain matters was that of a local meningitis leading to interference with vessels and a "block" in the visual tract. In Heinersdorff's case the whole visual portion of the occipital lobes was found *post-mortem* to be transformed into an abscess as the result of meningitis; in the present instance the nature of the lesion was probably similar, but less acute. Certain points in the family history seemed to suggest the existence of hereditary syphilis, but this was uncertain. W. G. S.

PRIESTLEY SMITH'S SCOTOMETER.

Mr. Priestley Smith writes:—"The description of the instrument in the *Ophthalmic Review* for May, in your report of the meeting of the Ophthalmological Society of March 8th, will hardly enable the reader to understand its construction, and is not quite correct. My own description will appear in due course in our *Transactions*, but meantime any readers interested in the matter may obtain a leaflet giving an illustration of the instrument, and directions for its uses, from the maker, Mr. R. Bailey, optician, Bennett's Hill, Birmingham."

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, May 3rd, at 8-30 p.m.

President, Mr. PRIESTLEY SMITH, in the Chair.

CARD SPECIMENS.

A Case of High Myopic Astigmatism showing Fissures in Descemet's Membrane.—Mr. Sydney Stephenson.

Ellen L., aged 21, was admitted to the Royal Eye Hospital on March 9th, 1906, complaining of defective sight in the right eye, which had existed ever since she could remember. There was no history of injury.

The vision in the right eye was counting fingers at 1 metre, while that of the left was $\frac{6}{18}$ No.H.M.; the tension in both was normal. After refraction under atropine, the correction in the right was found to be

$$\begin{array}{r} -10\cdot5 \text{ sph} \\ -12\cdot5 \text{ cyl} \end{array}$$

which, however, did not improve the vision, and that of the left was

$$\begin{array}{r} +1\cdot25 \text{ sph} \\ +1\cdot75 \text{ cyl axis } 115^\circ, \end{array}$$

giving $\frac{6}{12}$.

On examining the cornea, a series of fine greyish lines were seen on the nasal side lying parallel to one another, and making an angle of 15° with the vertical meridian. Several of the lines showed pointed extremities, and none of them extended along the whole length of the cornea.

The case was somewhat unusual, since those already described, in which fissures of Descemet's membrane have been observed, occurred, with one exception, in eyes which had become generally or locally distended.

Tumour of the Iris.—Mr. A. L. Whitehead.

Microscopical sections were shown of a growth taken from an excised eye in the case of a man aged 71, who otherwise appeared to be in good health. For eight weeks previous to his coming under observation, he had suffered from pain, redness, and failure of sight in the affected eye. A small grey nodule was observed at the periphery of the iris, with some inflammation of the surrounding area, and the lens was partially opaque. The nodule increased in size, invading the corneo-scleral junction and margin of the cornea, and the pain became more severe.

After excision a microscopical examination was made, and large masses of epithelial cells were found in the stroma of the iris; 3 months later some enlarged glands were found in the neck and other parts of the body which have remained stationary for 12 months.

Coloboma of the Choroid.—Mr. Winfield Roll.

E.W., aged 14, came to the Royal Westminster Ophthalmic Hospital, with the vision of the right eye $\frac{6}{36}$ and that of the left $\frac{6}{6}$.

Below the optic disc, in the usual situation, was situated the coloboma which was made up of two oval areas, one below the other, the lower one being the smaller. The latter was entirely surrounded by pigment, while only the lower half of the former show a pigmented edge.

Mr. Roll drew attention to the fact that the oval variety of coloboma is less common than the triangular, and that when a coloboma of the choroid exists without a corresponding gap in the ciliary body and iris, it is more likely to be of an oval shape (Posey).

An Apparatus for Estimating Hue Perception.—Dr. F. W. Edridge Green.

Venous Thrombosis.—Mr. R. W. Doyne.

Mr. Doyne showed a patient in whose left eye were many thrombosed veins all over the fundus, especially in the upper part; and he drew attention to the fact that while observing the vessels in the lower quadrant they could be seen to alter in shape.

Orbital Tumour in one Orbit following Recurrent Attacks of Oedema in both Orbits.—Dr. Rayner Batten.

This was a case beginning with the history of an acute attack of tonsillitis on October 31st, 1905, which cleared up under ordinary treatment. On November 24th, a considerable swelling developed in the left orbit with much pain and fixation of the globe; this also disappeared under medicinal treatment, but a few days later the right orbit became similarly affected; eventually the swellings in both orbits subsided. About the same time an offensive nasal discharge appeared, which soon got well, and after a few more abortive attacks of orbital swelling, a definite recurrence in the left orbit showed itself on December 26th, 1905. On January 1st, 1906, there was swelling in the left orbit affecting mostly the upper lid, with proptosis, ptosis, limitation of movement, displacement of the globe, and diplopia; and some resistance was felt under the roof of the orbit on the outer side.

On March 26th, these signs were still present, and in addition a nodular swelling was felt under the roof of the orbit on the nasal side; an exploratory incision was therefore made, and a large, firm, immovable mass was found passing behind the globe. After the operation all the symptoms improved, only leaving some displacement of the globe with

slight deficient upward movement; the vision in the left eye improved from $\frac{6}{24}$ to $\frac{6}{9}$. A piece of the tumour removed for examination showed merely some fibrous tissue and fat, but no diagnostic cellular elements.

Concussion Hole at the Macula.—Mr. G. H. Goldsmith.

Charles C., aged 15, came for advice, with the history of having been struck in the left eye by a piece of crust in December, 1905; this was followed by immediate loss of vision, as well as the appearance of specks in front of the eyes lasting 3 days; there was some ecchymosis of the lids.

On May 2nd, 1906, the vision in the right eye was $\frac{6}{5}$, while that of the left was $\frac{6}{60}$, with no refractive error. In the left macula was seen an oval area of a darker red colour than the rest of the fundus, with sharply defined edge, its long axis lying horizontally about $\frac{2}{3}$ of the diameter of the optic disc; this was surrounded by a definite halo, and between this and the red area were many highly refractile dots. No other abnormality was observed, but there was a well marked scotoma and some diminution in the visual field.

Tubercle of the Bulbar Conjunctiva.—Mr. W. I. Hancock.

A child, aged $11\frac{1}{2}$, was brought to the Central London Ophthalmic Hospital with the history that the mother had lately noticed a small red swelling growing on the right eye; 14 days before it was observed the child received a blow in the eye with a piece of wood.

Situated on the lower bulbar conjunctiva near the limbus is a raised, red, sessile growth, about 5 mm. in diameter, and having on its surface many yellowish white points; a piece was removed for microscopical examination, when many giant cells systems were found with necrotic areas, and tubercle bacilli. The child's opsonic index for tubercle bacilli was found to be 0.5.

Subsequently it was discovered that the mass had invaded the sclerotic, but there was no tubercular lesion in any other part of the eye.

PAPERS.

Congenitally Malformed Cystic Eye, causing Extensive Protrusion of the Upper Eyelid and Complete Extrusion of the Conjunctival Sac through the Palpebral Fissure.—Messrs. S. Johnson Taylor and E. Treacher Collins.

Mr. Johnson Taylor described the case of a child, aged 3 weeks, who was brought to him for advice in June, 1904, with a large cystic protrusion occupying the position of the left eye, and appearing to consist of the everted conjunctival surface of the upper lid. The swelling had been noticed at birth, and lately had increased in size. The child being

considered at that time too young to undergo an extensive operation. the mass was merely punctured and a considerable quantity of light, straw-coloured fluid drawn off, when the cyst collapsed, thus enabling some solid growth to be felt in the orbit.

A year later, when the child was again seen, the mass was found to project $2\frac{1}{2}$ inches from the margin of the orbit; and for the last two months had given rise to much trouble owing to periodical hæmorrhages from the conjunctival protrusion.

The whole mass was removed by making incisions along the margins of the lids, and in this manner dissecting up skin flaps above and below. By burrowing back, a pair of scissors was introduced well behind, and by this means the entire contents of the orbit were evacuated without altering the relation of the parts.

The child recovered well, though somewhat collapsed for a few days following the operation.

Pathological Report.—Mr. E. Treacher Collins.

The whole of the conjunctiva, which appears everted through the palpebral aperture, is thickened, folded, and covered with papillæ, with the exception of a small area, 9 m.m. wide, a little below the middle of the mass, where the surface is smooth, and covered by a membrane. Quite at the lower and posterior part of the specimen is a resistant structure like normal sclerotic, to which some of the extra-ocular muscles are attached, while others are inserted into the walls of the cyst. On the inner surface of this piece of sclerotic is some pigmentary tissue resembling choroid, but there is no pigment elsewhere. A mass of tissue presenting a yellowish-grey colour protrudes from the lower and outer wall of the cyst and encroaches on the cavity; and at the upper and anterior part the cyst wall is thinner than in other situations, and comes nearer the surface. There is no optic nerve to be seen.

Microscopic Appearance.

In the lids the tarsus is doubled inwards on itself, the upper more than the lower; and the conjunctiva, which soon leaves the tarsus to come forwards, contains numerous well-marked papillæ, and much new formed lymphoid tissue beneath the epithelium, especially in the neighbourhood of Krause's glands.

Over the small, smooth area, supposed to be cornea, the papillæ and down growths of epithelium cease, but in its place there exists laminated fibrous tissue, infiltrated with leucocytes and covered on the surface by a membrane of homogeneous structure.

The piece of tissue supposed to be sclerotic was proved to be of that nature; anteriorly it tapered off into the fibrous tissue, forming the wall

of the cyst but posteriorly it ended more abruptly; and separated from this by a gap 6 mm. wide, in which some atypical vitreous lay, was another small mass of scleral tissue containing a nodule of typical hyaline cartilage embedded in its anterior part. This atypical vitreous, which consisted of loose, vascular, connective tissue, containing cells with large nuclei, extended forwards from the gap into the interior of the cyst, where it joined with a partition proceeding backwards from the anterior wall, and at the point of junction was a much wrinkled capsule, through a hole in which the atypical vitreous found its way into the substance of the lens. Attached to the inner surface of the piece of sclerotic is some choroid containing elastic lamina and pigment epithelium; but the stroma is free from pigment though the vascular and lymphatic layers are both well marked. Anteriorly the choroid passed into a mass of unstriated muscle fibre, and at this point showed some folds indicating attempts at formation of a ciliary body.

The whole of the fibrous wall of the cyst was separated anteriorly by some lymphatic tissue spaces representing Tenon's capsule, and in front where it was in contact with the pseudo cornea, the conjunctival tissue and the wall of the sac were intimately connected.

The inner wall of the cyst is lined by a layer of epithelial cells continuous with the pigment epithelial layer on the inner side of the sclerotic, but here the cells are practically non pigmented. This evidently represents the outer layer of the secondary optic vesicle, the inner layer only consisting of a network of delicate fibres with branching cells and nuclear bodies similar to those of the nuclear layer of the retina, but nowhere is there any attempt at the definite structure of normal retina.

Mr. Collins then pointed out the unusual features shown by the specimen, the only case comparable with it being one described by Mayou in the *Transactions of the Ophthalmological Society*, vol. xxiv., p. 340. Most microphthalmic eyes contain a more or less spherical globe, and through a gap in the lower part of it retina protrudes, and is distended to form a cyst which passes forwards either into the lower eyelid or the lower part of the orbit. In the present case there was no complete globe, and the cyst was situated in the upper lid. Two cases similar in many respects have been described by Simeon Snell in the *Transactions of the Ophthalmological Society*, vol. xiv., p. 190, and another by Purtscher in *Intern. klin. Rundschau*, No. 34, 1894, but in neither case was there the protrusion of the whole of the conjunctival sac through the palpebral aperture. In all probability the wall of the cyst represents an enormous distension of the sclerotic coat, since the portion of scleral tissue is continuous at each end with the fibrous wall enclosing the cavity. Moreover, because the anterior part of the cyst is

lined by the imperfectly differentiated retinal tissue above described, and the posterior part by the epithelial cells, the cavity is composed of the space between these two layers; that is to say, the cavity of the primary optic vesicle before it is involuted. The explanation of the formation of the cyst is therefore to be found in the imperfect involution of the primary optic vesicle, though attempts have been made anteriorly as shown by the presence of the lens capsule, and also posteriorly by the ingrowth of mesoblastic tissue between the two pieces of sclerotic.

With regard to the gap in the posterior lens capsule, it is to be noted that the cells lining the posterior part of the capsule are formed very early in embryonic life, and are only present for a short time; therefore if these cells fail in their function of laying down the posterior capsule, a breach of continuity may exist through which mesoblastic tissue may find its way and become mixed with the lens fibres as was noticed in this case. This condition is not uncommon in microphthalmic eyes, and Mr. Collins has drawn attention to it in a case described by himself in the *Royal London Ophthalmic Hospital Reports*, vol. xiii., page 362, while a similar case is recorded by Parsons in the *Transactions of the Ophthalmological Society*, vol. xxii., p. 253; and Mr. Collins sees in this admixture of mesoblastic tissue with lens fibres an explanation of the clinical fact often observed that some congenital cataracts are very hard and difficult to break up. Hyaline cartilage in the sclerotic has been met with, and cases have been recorded (viz., Collins, in *T. O. S.*, vol. xvii., p. 264, 1897; Mitvalski, *Arch. für. Ophth.*, vol. xxii., p. 355; De Lapersonne, *Arch. d'Ophth.*, vol. xi., 207), but, although common in the lower animals, it is seldom met with in mammals, with the exception of the ornithorrhynchus and echinidæ.

Radium in the Treatment of Rodent Ulcer.—Mr. Mackenzie Davidson.

In this paper Mr. Mackenzie Davidson described the results of this form of treatment in twelve cases of rodent ulcer, one of recurrent epithelioma of the cheek, and one of a mole on the face.

He recalled the fact that in 1896 Becquerel discovered that uranium was radio-active, and as a result of subsequent investigation, radium was isolated as a substance possessing the same characteristics. Radium emits 3 kinds of rays, the α , β , and γ rays, each with different penetrating power and different velocities. The α rays never get through glass, the β rays are similar to X rays, and pass through glass but not through platinum or lead, and the γ rays are of extreme penetrating power and pass through several inches of platinum and other materials. In the treatment of rodent ulcer Mr. Mackenzie Davidson used about 10 milligrammes of radium sealed up in a glass tube, thus utilizing the β and γ rays, but

excluding the *a* rays. The tube is held immediately over the affected part by means of a clamp fixed by a strip of yellow plaster, or held in the fingers. It is applied for from 20 to 40 minutes to one part of the ulcerated surface, and is then moved to another portion until the whole of the area of the ulcer has been exposed to the action of the rays. No further application takes place for a month or 6 weeks; but the reaction, which shows itself in about 8 days' time, is allowed to quiet down slowly, when if necessary the application should be repeated. The actual exposure should not be too long, as severe and violent constitutional, as well as local reaction, may occur.

The results in Mr. Davidson's cases were extremely satisfactory, a definite cure being recorded in every case after applications varying in number from one to twelve.

Implantation Tumour of the Iris containing Wood Fibres.—Mr. Ransom Pickard.

A girl, 14 years old, at the age of 4 fell and struck her nose against the corner of a table; the swelling was first noticed in the left eye when she was 5 years old. There has been no increase in size from that time, but during the last 3 months there have been hæmorrhages from it occasionally.

The tumour was situated on the lower quadrant of the iris, 3 mm. in diameter, of a dull orange colour with a nodular surface; it extended forwards almost to the back of the cornea, and downwards nearly to the angle of the anterior chamber. L.V. $\frac{6}{9}$, and other parts of the eye normal. The tumour was removed by an iridectomy.

Microscopical examination showed the base of the tumour to consist of granulation tissue occupying almost the whole thickness of the iris; in the front part of the mass were seen irregular groups of epithelial cells, and in the midst of the granulation tissue a small cavity was seen near which were a few wood fibres. The main mass of the tumour consisted of groups of cells in various stages of degeneration, some having formed cystic spaces containing masses of broken down, faintly staining cells, with a slender framework of connective tissue, and lined by a layer of flattened cells. Mr. Pickard attributes the clinical condition and pathological appearance to a splinter of wood at the time of the accident entering the eye and carrying with it in its passage through the cornea some of the surface epithelium which has subsequently undergone proliferation.

The paper was illustrated with lantern sections.

MALCOLM L. HEPBURN.

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EVULSION OF AN EYE DURING BIRTH.

By ADOLPH GAD, M.D., Copenhagen.

A CHILD, eight months old, was lately brought to the Ophthalmic Department of the Poliklinik. It presented a complete loss of the left eye, a somewhat flattened orbit, and a badly-healed rupture of the lower eyelid, but was otherwise healthy. The history was this:—During the labour, which was protracted by reason of a narrow pelvis, the forceps were applied and delivery was made without great difficulty. The child bled from the left eye, the integuments of which were much swollen, and stitches were put into the ruptured lid. The next day the medical man found the eye lying loose in the orbit, having about half an inch of the optic nerve attached to it, and being held only by some lacerated tissue, consisting of muscle and conjunctiva, which was divided. There was no reason to doubt that the forceps had been correctly placed, for in front of the right ear was a scar, recognised both by the doctor and by the mother as having been produced by the forceps, and the other blade must necessarily have taken hold on the left side far behind the eye. The forceps did not slip and were introduced only once.

How is an indirect evulsion of the eye by the forceps to be explained? A paper by Brune Wolf (*Hirschberg-Festschrift*, Leipzig, 1905) shows that injuries to the eye during labour are not nearly so rare as is commonly supposed. Hæmorrhage is said to take place in 25 per cent. of all births. Hæmorrhage into the anterior chamber, exophthalmos, paralysis of nerves, and fractures of the bony walls of the orbit, especially of the roof, are all met

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with. Limiting ourselves to the point in question, we note that total ablation of the eye has been recorded in nineteen cases. Twice the unlucky attendant mistook the face of the child for the breach, and tore out the eye by introducing a finger into what he believed to be the anus, but in the large majority of these cases forceps were used and usually to a high-standing head. It is obvious that when, under such circumstances, the forceps take hold in the occipito-frontal diameter, it may easily happen that the tip of one blade enters the orbit and scoops out the eye, rupturing the optic nerve, or breaks in the orbital wall so as to leave no room for the eye. Further, there are cases of ablation on record, both by low-standing and high-standing head, where the forceps undoubtedly were applied correctly, and where their influence must therefore have been indirect. In several cases exophthalmos was present, and in nearly all cases of exophthalmos or ablation in which a *post mortem* examination was made, the roof of the orbit showed a fracture. Lastly, there is one case, a very singular one, of narrow pelvis and protracted labour, in which the uterine contraction alone, under influence of ergot, was able to cause injury with hæmorrhage sufficient to give rise to exophthalmos and ablation. No case is on record where ablation has occurred with after-coming head.

So far the cited paper. We notice how exophthalmos and ablation accompany each other. The exophthalmos is caused by the hæmorrhage and by the flattening of the orbit arising through fracture of the roof, and the sharp borders of the fractured bone may divide the optic nerve. But hæmorrhage and flattening alone could not rupture the optic nerve, and do not in any way account for the tearing through of the lower lid.

I suppose that the process takes place in the following way:—Uterine contraction and the forceps cause an injury, probably always a fracture, the hæmorrhage from which is sufficient to push the eye forwards to the level of the orbital entrance. During remissions in uterine contraction or pauses in the traction of the forceps the hæmorrhage and the exophthalmus increase, and as the uterus and forceps recommence their work and force the head forwards, the upper lid is pressed against the wall so as to resist the passage of the head, and this pressure forces the eye out of the orbit, and may be even strong enough to tear through the optic nerve and lacerate the lower lid, or even tear it off. The eye is then, by the birth of the head, placed under the zygomatic process on the soft cushion of the maxillary groove, perhaps quite detached, or it may be drawn back into the orbit by the incompletely ruptured muscles.

To revert to our case. The narrow pelvis, the uterine contractions, and the forceps gave rise to hæmorrhage, probably from fracture of the orbital roof, and this led to ablation of the eye in the manner above described. In my opinion the medical attendant was right in using forceps, placed them properly, and is not to blame for the disaster which happened to the child.

It is remarkable how often the roof of the orbit was found to be fissured or fractured in the cases in which a post mortem was made. It is certainly a *locus minoris resistentiæ*, and this may be explained by the fact that the bone is thinner and stands at a higher level than the rest of the base.

REVIEWS.

WILBRAND and SAENGER. **The Neurology of the Eye.**
A Handbook for Neurologists and Ophthalmologists.
Wiesbaden: J. F. Bergmann.

THE tardy appearance of the later volumes of this treatise renders it desirable that a notice of Vols. I. and II. should be published without further delay. The first part of Vol. III., which is also in print, will be more conveniently considered when the volume is complete.

The authors have undertaken a huge piece of work, and so far have carried it out with a thoroughness which is wholly commendable, and which renders these volumes invaluable as books of reference. The bibliography given in each volume is, in itself, of great value, and is probably fuller than any previous list of the kind. The volumes are so large and the subjects are treated with such elaborateness that it is impossible in a limited space to give even the briefest of detailed reviews. We do not propose in this notice to do more than draw attention to some of the specially interesting parts of the two volumes now before us.

Vol I., containing 696 pages and 151 illustrations, is devoted to the Relations of the Nervous System to the Eyelids. Vol. II., which extends to 324 pages, with 49 illustrations, is on the Relations of the Nervous System to the Organs of Lacrimation, the Conjunctiva and the Cornea.

Vol. I. In Chapter 4, concerning the association of movement between the eyelids and eyeball, the theories, to the number of seven, offered in explanation of Stellwag's and von Graefe's lid phenomena are considered, but no decisive opinion on their respective merits is given. The authors appear to hold that these lid signs are explained either by a nervous disturbance of the associated muscular arrangements (Möbius, Bruns) or by a purely mechanical result of the exophthalmos. In the same chapter we find an interesting account of the cases of movement of the upper eyelid in association with movement of the mouth and lower jaw. Block has recorded an example in two brothers. In the majority of instances the association is between the

muscles supplied by the oculomotorius and the trigeminus, and is unilateral; in others the association concerns the third and facial nerves. Many cases of this kind have been reported since Gunn first drew attention to them in 1883; Wilbrand and Saenger give references to some twenty clinical records; at present there is no anatomical evidence as to the nature or site of the anomalous nerve connections.

"Paralysis of the Levator Palpebræ Superioris: Ptosis" is the heading of Chapter 6, and as evidence of the thoroughness with which the subject (in all its medical relations) is dealt with we need but state that some 470 pages are devoted to it. "Cortical Ptosis" naturally receives careful attention, and a table is given of 25 cases in which post-mortem examination revealed a more or less circumscribed lesion. Although in a series of collected cases, in consequence of the diverse nature of the lesions, it is unlikely that accurate localisation could be shown, these cases have a real value. With one exception they indicate the parietal lobe as the seat of the disease, the inferior parietal lobule, and especially the angular gyrus, being the area most frequently involved. As the authors point out, there are many post-mortem records of lesions in this part of the brain in cases in which, during life, ptosis was not present.

Ptosis due to nuclear lesions leads to consideration of the views of different experimenters on the subdivisions of the 3rd nerve centre. These are presented in tabular form, from those of Hensen and Voelkers (1878) to those of Bernheimer (1898).

Ptosis in *Tabes Dorsalis* is fully described. Attention is directed to its occurrence as an initial symptom, and to the difficulty in diagnosis which may then arise between incipient *tabes* and cerebro-spinal syphilis. A valuable tabular statement is given of cases of ptosis in *tabes*, with records of post-mortem examination.

Ptosis in *Insular Sclerosis* is a clinical symptom which, the authors think, is insufficiently appreciated. It may be due to a cortical, subcortical, nuclear or peripheral lesion. No case has been reported in which a purely cortical lesion has been found post-mortem, although there is one (Taylor) in which it is possible that the paralysis was caused by changes which were evident in the cortex.

Ptosis in *Syringo-myelia* is an unusual symptom, although paralysis of ocular muscles and diplopia were found by Schlesinger in 12 per cent. of cases of this disease.

The number of "Infection Diseases" in which, or subsequent to which, ptosis may occur, seems surprisingly large when given in series. The list includes Diphtheria, Influenza, Measles, Epidemic Cerebro-spinal Meningitis, Typhus, Pneumonia, etc. A tabular statement of cases of post-influenzal ptosis and paralysis of ocular muscles is given. Although influenza is so common a malady, the reported instances of ocular paralysis are few in number; 13 cases of paralysis of third, 14 of sixth and 9 of fourth nerve are given. In the same section the authors give a brief account of Gerlier's disease, described also in Japan, where it is called kubisagari, characterised by vertigo, ptosis, oculo-motor paralysis, and paralysis of some of the muscles both of trunk and extremity. Clinically, the disease bears some resemblance to chronic bulbar paralysis, but its pathology is as yet undetermined.

Ptosis in Cerebral Syphilis is fully discussed. In no other form of disease is the third nerve so frequently or so diversely involved. Uthoff's figures in relation to this question are very striking, while demonstrating at the same time that involvement of the oculo-motor apparatus in cerebral syphilis is much less common than lesion of some portion of the visual tract. The relative frequency of paralysis, in his reports, is: 3rd nerve, 66; 6th nerve, 29; 4th nerve, 6.

The consideration of Ptosis in Cerebral Hæmorrhage, Softening, Abscess, and Tumour, occupies many pages, and contains much interesting matter. Following this is the section on Ptosis in Basal Affections, *e.g.*, Meningitis of various kinds. In 54 cases of tubercular meningitis (with post-mortem examination) ptosis was present 14 times. This is a higher percentage than that given by some previous observers; Seitz found third nerve paralysis in only 7 out of 67 cases.

Ptosis in Recurrent Third Nerve Paralysis (Migraine Ophtalmoplégique of Charcot and others) is discussed under the heading of "Ptosis as a Functional Nerve Disturbance," although the authors anticipate the objection which may be raised to this grouping. The paralysis in these cases is almost invariably limited to one side; the instances of alternating right and left paralysis hitherto published are, with one exception, rejected by the authors. Two groups of cases are obvious—(1) those in which the paralysis entirely disappears between the attacks; (2) those in which the paralysis persists to a greater or less degree, but undergoes marked exacerbation

during each attack. The majority of recorded cases belong to this second group. No post-mortem records of group (a) are available. In two cases belonging to group (b) autopsies have been made; in each instance a small tumour was found involving the trunk of the third nerve. Whatever the exact pathology of the majority of these cases may be, their very close association with genuine migraine (and in some instances the alternation of attacks of paralysis and ordinary migraine) cannot be overlooked. On the other hand, it has been pointed out by more than one observer that some patients very clearly differentiate between migraine of the usual type and attacks of pain and paralysis. The authors are of opinion that recurrent oculomotor paralysis is not to be considered as a disease *sui generis*, but as a clinical symptom-complex (the result of varying undetermined causes) in which the third nerve is always involved and in which the symptoms in general conform to one type.

The last three chapters of the volume are devoted to Pathological Conditions of the Facial Nerve and their Relation to Ocular Lesions.

Vol. II. Chapter 2, which occupies the larger part of the volume, concerns the Relation of the Trigeminal Nerve to the Eye. The section dealing with Trophic Disturbances chiefly attracts our attention.

Herpes Corneæ Neuralgicus (Schmidt-Rimpler). In cases of severe neuralgia along the course of the supra-orbital nerve and in the eyeball the appearance on the cornea of a number of very small clear or slightly opalescent vesicles is not uncommon. Occasionally there are also diminution of sensitiveness of the cornea and lowering of intra-ocular tension. The vesicles disappear in 12 to 18 hours, but may reappear periodically with recurrent pain.

Herpes Corneæ Febrilis, described by Horner, is generally associated with vesicles on the skin over some part of the area of distribution of the trigeminus. The vesicles on the cornea are, in part at least, subepithelial, and lead to definite loss of substance and the formation of areas of ulceration. This form of corneal affection is thought by some observers to be identical with other forms described as Dendriform Keratitis, Malaria Keratitis, etc.

Herpes Zoster Ophthalmicus. Like all affections of the trigeminus, herpes zoster involves the area of the first division

of the nerve much more frequently than that of the second division. In 20 cases collected by Wangler the second division was involved in one only. Hutchinson's dictum that herpes zoster ophthalmicus does not occur symmetrically, and does not recur, is, according to the authors, nearly, but not absolutely, correct. The frequency with which the eyeball becomes involved seems very variable. Hybord gives it as 44 times in 98 cases (45 per cent.), Pacton as 89 in 126 cases (70 per cent.). The rule laid down by Hutchinson, that the eyeball suffers only when the eruption involves the area of the naso-ciliary branch, has been shown by many later observers to hold good for the majority of cases, but exceptions to the rule are not very infrequent. The number of post-mortem examinations in cases of herpes ophthalmicus is very limited. Willbrand and Saenger give notes of five; the earliest, that of Weidner, in 1870, the most recent that of Head and Campbell, in 1900. The early views of von Bäreusprung, that the explanation of herpes intercostalis was to be found in the spinal ganglia, and that the skin eruption was dependent upon irritation of the cells of these ganglia have received ample support from pathological researches. Inflammatory, hæmorrhagic and degenerative changes have been described, especially by Head and Campbell, in these ganglia. In herpes ophthalmicus similar changes have been found in the Gasserian ganglion. Willbrand and Saenger are of opinion that herpes zoster may be due also to a pure neuritis without any lesion in the ganglia.

Neuro-paralytic Keratitis. The corneal affections in lesions of the trigeminus are discussed in considerable detail in regard to their clinical characteristics. The percentage of cases of trigeminal paralysis, in which keratitis occurs, is almost the same as that of *corneal* complications in herpes ophthalmicus, viz., about 33 per cent. A very valuable tabular statement of 170 examples of trigeminal paralysis, all with post-mortem examination, is given. From this list it appears that the lesion most frequently involved the nuclear and root area, but that corneal trouble was relatively less common in these cases than in such as showed a lesion of the nerve trunk. Theories, to the number of seven, advanced to explain the occurrence of neuro-paralytic keratitis, are discussed at some length, beginning with the "purely trophic disturbance" hypothesis, and ending with the theory of mycotic infection of the enfeebled cornea. The authors hold the opinion that the keratitis results

from irritation of the fifth nerve, in this respect closely resembling the cutaneous and corneal lesions of herpes zoster.

The concluding section of the volume is devoted to the condition of the trigeminus in various diseases of the nervous system, such as tabes dorsalis, disseminated sclerosis, etc.

H. ARMAIGNAC (Bordeaux). **Auto-Synoptometry.** *Recueil d'Ophthalmologie*, February, 1906.

Two instruments are described for the purpose of examining binocular vision. The first is an amplification of the well-known pencil test. The author has a test card on which are printed a series of columns of short words, with each column composed of similarly graded types. The patient has to view this card at a certain distance, whilst a pencil is placed midway between the test and the eyes. It is possible to compare simultaneously the visual acuteness of the right and left eyes and of both eyes by comparing the sharpness of impression gained of the middle or right or left column of words. The test is very neat, and gives a better appreciation of small differences in the acuteness of the eyes than can be gained by an alternate use of the eyes.

The second instrument is mainly of use in the detection of feigned blindness in one eye. It is simple enough, merely a box containing two mirrors pivoted vertically and facing two sight-holes cut in one side; but the results to be obtained from its use are exceedingly complex. By setting the mirrors at various angles the reflected images of a circle and a cross fixed at the corners of the box to the right and left of the patient, and the images of the patient's own eyes are to be seen in a great variety of positions. The images seen in the mirrors at any given angle of rotation are marked on a chart, and the comparison of the patient's answers with this chart will show the measure of truth of his statement of visual disability. The range of variation of the images that can be presented is enormous, and the difficulty a disingenuous patient would have in determining the eye with which the images are seen is so great that he would surely be brought to confusion. The contrivance is of value where there are strong inducements to malingering, such as for the purpose of escaping compulsory

military service. The reviewer's own experience of British troops does not suggest that malingering of this order is common with us, but the need of devices of this order is not uncommon in cases of hysteria or occasionally in purposeful exaggeration of injuries for which compensation is claimed.

N. BISHOP HARMAN.

H. BICHELONNE. **Unilateral Mydriasis in Early Phthisis.**
Annales d'Oculistique, October, 1905.

BICHELONNE describes a case of mydriasis on the right side in a man of twenty. The mydriasis, which was accompanied by slight widening of the palpebral aperture, was of the spasmodic type usually considered to depend on irritation of the sympathetic nerve, while the only definite pathological abnormality found in the patient was a patch of induration at the apex of the right lung. Bichelonne considers that the mydriasis was due to direct irritation of the sympathetic by the lung disease or by the affected glands in its neighbourhood.

Several continental writers have described cases of the sort, notably Rampoldi (*Annali di Ottalmol.*, 1885, 1886, 1890 and 1894). One case mentioned in the 1890 paper was examined *post-mortem*, and the inferior sympathetic ganglion was found to be adherent to the thickened pleura and the seat of an intense leucocytic infiltration. At the Medical Congress in Rome (1894), Destiée, in a communication on "A premonitory sign in pulmonary tuberculosis," stated that he found inequality of pupils in 97 per cent. of the cases of phthisis. Other papers referred to by Bichelonne include one by Déhéran (*Presse Médicale*, 1904, p. 630), and Pernot's Thèse de Paris (March, 1905). Pernot, dividing the lung disease into its three stages, gives the following:—

First stage, 324 cases, of which 19 had mydriasis on the affected, or on the more affected, side.

Second stage, 352 cases. Of these 27 had unequal pupils, most of them having mydriasis on the affected side.

Third stage, 464 cases, of which 66 had anisocoria, generally a miosis.

Bichelonne himself, after his attention had been drawn to the subject, found 10 instances of mydriasis on the affected side in 69 cases of lung tuberculosis.

Observers in this country have noted inequality of the pupils in association with cancer of the œsophagus, mediastinal growths, and aneurysms, but I have failed to find any mention of the occurrence of anisocoria in cases of phthisis in our text-books. My friend, Dr. Mitchell Bruce, writes to me: "I cannot recall definitely an instance in which I observed the pupil affected by apical tuberculosis; but I know I have often observed unequal pupils in out-patient practice at Brompton, and I may have passed over the observation without making a note of it. I mean that the fact that I cannot recollect any such observation is not at all unfavourable to the view that the sympathetic is sometimes involved in a puckered apex."

Dr. Mitchell Bruce was kind enough to hunt through many works on lung disease, and the only reference he could find to the subject is the following from "Diseases of the Lungs," by J. Kingston Fowler and Rickman J. Godlee (p. 682):—

"Irritation of the sympathetic is a much rarer event, and gives rise to conditions the opposite of those above described.

"The importance of observing these changes in the eye is not so much in connection with obvious cases of aneurysm or mediastinal tumour, as in those not uncommon ones where a pleural effusion is not easily accounted for. The presence of the ocular symptoms will suggest the existence of some mediastinal tumour, which need not, however, be malignant. They may result, as has been said, from the pressure of an aneurysm or enlarged mediastinal glands; and, though we can bring no cases verified by a *post-mortem* examination to justify our belief, we think it not improbable that the contraction of inflammatory products in the neighbourhood of the apex of the lung may, in exceptional circumstances, produce the same result.

"It is remarkable that these very obvious phenomena do not appear to have been observed before 1850, and to have been first described in this country in 1855 by Dr. Walshe; but even now slight degrees of the affection are, we believe, not infrequently overlooked."

It seems probable that unequal pupils may occasionally be found in cases of lung tuberculosis if carefully and system-

matically looked for. If present in the earlier stages, as stated by some continental writers, the symptom may be of value as an aid to diagnosis, and the point appears to deserve attention of those who see large numbers of patients with lung disease.

WALTER SINCLAIR.

V. CARLINI (Leghorn). **Amaurosis consequent upon Hæmorrhage.** *La Clinica Oculistica*, February, 1906.

Loss of sight in consequence of hæmorrhage is a rare occurrence, and its nature is not by any means quite certain even yet. Amaurosis has chiefly occurred when the hæmorrhage has been of intestinal and uterine origin, but it is not probable that the actual source of the blood affects particularly the eventual result. It is also the case that amblyopia has followed upon hæmorrhage which was not at all very severe; but in this, as in all cases of the condition, one must be careful to discriminate between an amblyopia caused by hæmorrhage on the one hand, and on the other some error in the general health, causing both the hæmorrhage and amblyopia. It is in traumata that the most copious hæmorrhages exist, yet these very rarely, if ever, give rise to blindness; indeed, such an occurrence is denied by some writers; it is said, for example, that no such case occurred among the wounded in the whole of the Franco-Prussian War of 1870.

Carlini now gives the history of an interesting case with which he met. It was that of a young man (23), a wheelwright, of excellent health, who while at work one afternoon accidentally inflicted a severe cut upon his left hand with an axe. The radial artery bled copiously, and owing to his distance from help twenty minutes elapsed before treatment was begun. During this time he lost, of course, a great deal of blood, and when help arrived he was not only exsanguine, but the pupils were dilated and immobile. He had vomited, and was seized with convulsive attacks,—symptoms which are constantly present only in excessive anæmia. He recovered rapidly, however, when the artery was secured and transfusion performed. Next morning, when for the first time he recovered consciousness, he asserted that he was quite blind. He generally lay with the eyes closed; the fundus and media were absolutely

normal. By the fourth day he was able to be out of bed for a short time; vision was beginning to return, and he could count fingers near to the eyes. In the right eye the lower field was quite lost, and the outer part also limited. Eventually vision rose to $\frac{5}{50}$, and the fields extended greatly, but finally still showed a section-like defect at lower left side,—an imperfect left homonymous hemianopsia.

In a very few such cases as the above there have been from first to last no ophthalmoscopic changes whatever; in a somewhat larger number there has been, either at once or later, some decided pallor; in another group œdema of the disc with hæmorrhages along the retinal vessels; and in yet another a true papillo-retinitis.

There are on record three autopsies of persons who suffered from this lesion, supplied by Hirschberg, Ziegler, and Raehlmann. That of Hirschberg is somewhat vitiated by the long space of time between lesion and autopsy, namely, three years. In Ziegler's case there had been visible ophthalmoscopically a papillo-retinal œdema, and at the subsequent examination fatty degeneration was established, particularly about the level of the lamina cribrosa. Twenty days in this case had elapsed between lesion and *post-mortem* examination.

In 1860 von Graefe suggested as an explanation of the loss of vision that just as hæmorrhages were present in the retina so might one also have occurred in the sheath of the nerve or interstitially among its fibres; atrophy would follow in due course. One objection to this theory is that there is no basis for it, and it would not account for the cases in which the loss of vision occurred after some days or even weeks. Nor is the theory likely to be acceptable as regards such cases as the present, in which there were no hæmorrhages present in the fundus. Samelsohn propounded a theory in explanation which may thus be very briefly expressed:—At the moment of the loss of blood the intra-cranial contents are reduced, and a vacuum would result were it not that lymph and cerebro-spinal fluid are attracted. Later, when blood is re-supplied to the cranial cavity, the lymph is again (in part) driven into the inter-sheath space of the nerve, thus producing a condition closely analogous to choked disc. There are other arguments which cast great doubt upon this theory, but in the particular instance dealt with by the author it is enough to say that from first to last there was no change visible with the ophthalmoscope which

could give the smallest support to such a theory. Other suggested explanations are that there occurs a retinitis, neuro-retinitis or retro-ocular neuritis, and these agree more or less with the records of certain cases, but in this instance (as in some others) the absence alike of any pallor of the disc, even after five months, and of a central scotoma, seems to negative the suggestion. According to some the actual loss of vision is due to anæmia of the retina, produced by the hæmorrhage acting either directly upon the nerve elements or by causing a spasmodic contraction of arterioles. Hirschberg has suggested that this may be due to an endarteritis which had previously not been in an active condition; this might be true of certain of the cases of "pathological" hæmorrhage, but cannot apply to the present case at all events. Spasmodic contraction of arteries is not impossible, but is hardly likely to arise in a case of almost fatal hæmorrhage from accident.

The theory formed by the author is rather that of a cortical lesion produced by the œdema which must follow a large hæmorrhage. A point in favour of this is that in a considerable proportion of the cases (as in the present one) the defect of vision has been a more or less complete hemianopsia. Further, in Carlini's case the pupillary reaction was retained even from the very first, which would indicate a central rather than a peripheral lesion, as does also the occurrence of convulsive seizures.

Carlini very sensibly does not seek to establish the hypothesis that all cases of amaurosis after hæmorrhage are to be explained in this way, but in his particular case the indications point in this direction.

W. G. S.

MARC LANDOLT. Does the Ciliary Ganglion exert any influence on the production of the Aqueous Humour?

From the Laboratory of the Ophthalmological Clinique, Würzburg. *Archives d'Ophthalmologie*, March, 1906.

LANDOLT has, under Hess's supervision, investigated the question by which his article is headed. His experiments are very few in number, but all gave a similar result.

Nearly half a century ago the physiologist Claude Bernard stated that removal of the ophthalmic ganglion arrested the formation of the aqueous humour; if the anterior chamber

were emptied by puncture of the cornea, it would not be refilled. He was well aware of the rapidity of reproduction of the aqueous under normal conditions.

Landolt has experimented on dogs, removing the ciliary ganglion from one orbit, and subsequently tapping the anterior chamber of each eye. As a result of three such experiments he found that there was no appreciable difference in the rate of formation, or the quantity, of the aqueous in the two eyes, even with repeated evacuation of the anterior chamber. His conclusions are that removal of the ciliary ganglion does not in any way affect the formation of aqueous humour, and that there is no evidence that the ganglion is a centre of secretory energy.

In the earlier part of his paper he discusses at some length the conflicting views as to the production of the aqueous humour, viz., that of active secretion by glandular structures in the ciliary processes, and that of simple filtration through the blood-vessels and epithelium of these processes. His views, like those of nearly all recent writers on this subject, are in support of the filtration theory.

J. B. L.

P. DE FONT-REAULX. The Results of Removal of the Lens in High Myopia. *Annales d'Oculistique*, February, 1906.

THIS subject has been so long before the profession without a satisfactory appreciation of its importance, risks, and final results being arrived at that Font-Reaulx has gone over the cases published up to 1900, and has picked out those which have been observed for a period of five years or upwards in order to set some idea of the final or remote results or usefulness of Fukala's operation. Furthermore, in making this selection he has only noted the cases in which the operation was normal or uncomplicated and where no more than two interferences were necessary after the first discussion. Many skilled hands have given it a trial, and many of them have ceased to practice it. This is probably due to the results, immediate or remote, not having been sufficiently satisfactory and uniform to warrant undertaking the operation which at the best is surrounded by so many risks and pit-falls. Hirschberg has given it up since 1901. Schmidt-Rimpler considers "that more highly myopic eyes perish through the Fukala

operation than without it," and therefore resorts to it in rare cases only.

Of the 1,620 cases published up to 1900 with which Font-Reaulx deals, a very large proportion come from the clinics of a comparatively few oculists, leaving a large number who abstain from the treatment. In some large clinics the operation amounts to a rarity. It is to be feared that whatever good name the operation has won for itself, it is due to the immediate, and very often gratifying, results—gratifying to the surgeon only in too many cases. For it is to be noted that after a successful operation which may double or treble the acuteness of vision of the operated-on eye the patient prefers to use the complete eye for near work, and more particularly is this the case when the aphakic eye is emmetropic or hypermetropic.

The questions set forth to be answered are:—Does the operation render the eye more useful? Are the results durable? Does the eye cease to lengthen? Are the lesions of the retina and choroid arrested? Can retinal detachment and glaucoma be ignored?

Utility should be aimed at, and not acuteness of vision. Most high myopes consult the oculist for some difficulty for near work, and they hope to have this remedied, and not to gain an increased visual acuteness for distance without the use of glasses. Does he realise his hopes? Font-Reaulx thinks not, for most of the patients use the complete eye for near work, provided always, of course, the myopia is not complicated by any serious deep lesions. As far as the immediate results are concerned there is no denying that the eye operated upon sees better, sees further, and has a much increased acuteness: nevertheless, it is the whole eye that is used for near work. Of the 1,620 eyes, 1,492 were improved. These are good results, mostly immediate no doubt, yet we do not find the high myopes flocking in to have their lenses removed, nor do we find a general desire on the part of operators to advise operative treatment. Why? We can promise the operation to be successful with as much confidence as we can any operation, but we fear the future results. So that, with a view to giving a useful eye one has to consider the occupation of the patient and the amount of the myopia. If the myopia is less than 20 D, the aphakic eye becomes hyperopic, say to 2, 3 or 4 D, and for near work must wear +6, +7, or +8 D, which

will be badly borne by the patient. It is better to aim at leaving the eye slightly myopic by selecting cases above 20 D. We are advised to guard against the danger of diminishing the capacity of the eye for work in increasing its distant acuteness. We are not to lose sight of the end to be attained, viz., utility, and not what would be most gratifying to the operator, viz., a doubling or trebling of the visual acuteness. There is a general accord among ophthalmologists as to the immediate results of the operation, but this is by no means the case when we come to deal with the remote results. Of Pflüger's 100 cases, 15 were seen after five years, and showed better results than are found elsewhere. The visual acuteness was increased and the eye not operated upon was used for near work, although its acuteness was much below that of the aphakic eye in most of the cases. The notes concerning the condition of the retina and choroid before and after operation were for the most part scanty. However, without following Font-Reaulx's discursive paper too closely, one may take his conclusions as not very favourable to the extraction of the lens in high myopia.

As to the question of the operation putting a stop to the lengthening of the eye, there seems to be evidence that it does not, for it is not unusual to have to change the glasses after operation—an increase in the minus glasses and a decrease when they are plus. In estimating the relative increase in length of two eyes, one of which is aphakic and the other complete, it is useful to remember that an increase in length of 1 m.m. in the case of aphakia represents a refractive increase of 1.5 D, whereas in the complete eye the same increase in length represents an increase of 3 D. Otherwise one might be led to suppose that the lengthening was going on twice as fast in the unoperated-on eye, and to give the operation credit of having had a good effect in this direction.

From the author's point of view there would appear to be no reason why the removal of the lens should act favourably on the lengthening of the eye. Taking progressive high myopia as a disease, the refractive vice is one of its symptoms, as are also chorio-retinitis and detachment of the retina, so that the removal of the lens will not arrest the progress of the disease any more than the prescribing of full correction will, although it may remove exciting causes such as convergence, accommodation and posture. Arguing on the same lines, the removal of

the lens will have no good effect on the chorioiditis. He summarises on this point thus: "The myopia increases because the eye is diseased; it is not that the eye becomes diseased on account of the myopia. The deep lesions and the refractive error run a parallel and relatively independent course, they being two symptoms of the same disease, progressive high myopia." Again, in dealing with detachment of the retina and glaucoma, the absence of the lens can have no beneficial or other effect on the retina; but the operation itself, with its many risks, *e.g.*, loss of vitreous, hernia of the iris, synechiæ, etc., is a matter of grave concern to the retina. It is in cases with such complications that we meet with early detachment, and such cases do not fall under the eye of the statistician five years after. Nearly all operators have had detachments to deplore. Pflüger had a few: Sattler had 4 in 86 operations; Fröhlich and Mier had 4 in 56 and 50; Rohmer, 1 in 8; Ebner, 1 in 5; Lang, 2 in 5; and Alft, 1 in 2. So that the complication is far from rare.

In conclusion, we are advised that the operation of the removal of the lens in high myopia is one of the most serious in ophthalmology on account of the numerous secondary operations that are frequently called for. Font-Reaulx does not by any means wish to discourage his confrères or do away with the removal of the lens in high myopia, but his object is to show up the risks and disappointments too commonly experienced, and to bring home to operators the responsibilities which they should realise when consulted by high myopes.

H. L. MOONEY.

A. TERSON. **Guaiacol in Ocular Therapeutics.** *Die Ophthalmologische Klinik*, Jan. 30, 1906.

TERSON employs synthetically-prepared guaiacol; it has valuable antiseptic, alterative, anæsthetic, analgesic and antipyretic powers which he is convinced, after several years' experience, can be advantageously used in ophthalmic practice. As a local application to the skin guaiacol is best used dissolved in oil or glycerine, a 10 per cent. solution being useful in herpes zoster. To these solutions may be added if desired other therapeutic agents, such as menthol, camphor, dionine, and quinine. In facial neuralgia, as in numerous inflammatory conditions like dacryoadenitis, phlegmonous dacryocystitis, boils etc., it

may be combined with the other customary substances employed. To collyria containing copper sulphate guaiacol may with advantage be added, as it renders the pain following the instillation slighter in amount and of less duration; the alterative action of the guaiacol also comes into play.

Terson recommends the following formulæ, viz.:—

Cupr. Sulph.	1·0	or Cupr. Sulph.	
Guaiacol	0·5	Guaiacol āā	1·0
Glycerine	10·0	Glycerine	20·0

In burns of the conjunctiva a 1—50 solution of guaiacol in freshly sterilised oil is recommended, to which may be added cocaine or atropine if desired, the alkaloids which are freely soluble in oil being employed. The regular use of oily solutions of guaiacol is absolutely indicated in the various forms of tuberculosis of the superficial parts of the eye, where the local application is to be preferred. Guaiacol is useful as a local application in many nasal conditions, some of which are attendant on or excitors of eye affections. Guaiacol may be given by the mouth in ocular conditions associated with general tuberculous or mixed tuberculous and specific affections, and may be given in the form of pills or capsules, or may be added to cod-liver oil with or without the addition of eucalyptus or iodoform. Guaiacol can also be given in eye diseases in the form of injections of an oily solution. Injections of biniodide of mercury are rendered much less painful by the addition of guaiacol, an oily solution in the proportion of 1 in 30 produces hardly any pain, and is to be preferred to all other mercurial injections: it has no lowering after effects, and far surpasses the anæsthetic action of cocaine, stovaine or dionine in mercurial or saline injections. Terson is quite convinced that the valuable qualities of synthetic guaiacol will procure for it a lasting place in ophthalmic therapeutics.

E. M. LITHGOW.

SCRINI and FORTIN. **Practical Manual on Choice of Eyeglasses and Examination of Vision.** Paris: Vigot Freres, 1906.

SOME such title as “refraction of the eye” or “errors of refraction” might quite well have been given to this book, which embraces the following subjects:—Lenses, the emmetropic eye, different forms of ametropia, their estimation and correction,

heterophoria, etc. Included with the tests for binocular vision is a description of Javal's test and the diploscope of Remy. The work should prove useful to those engaged in the study of errors of refraction.

T. AXENFELD (Freiburg). **Præcorneal Iridotomy.** *Klinische Monatsblätter für Augenheilkunde*, January, 1906.

THAT the iris hook (Tyrrell's hook as it is usually called) is a very valuable instrument for the performance of optical iridec-tomies (and for the matter of that of other varieties of iridectomy also) is a proposition which anyone who has really tried it will heartily endorse. It enables the operator to "dose" his iridec-tomy with great nicety, and its use causes the patient no pain, and therefore he remains quiet. Axenfeld states, further, and the reviewer's experience is entirely to the same effect, that he has never yet seen any injury done by the hook to the lens,—an accident which some surgeons seem to dread. The author incidentally also points out objections to the corneal situation of the section in iridectomy: he disapproves decidedly of placing the section there, though in a number of text-books this is recommended.

When performing optical iridectomy it is of course important to have the new pupil small; this object is better attained by the use of the hook than of the forceps. But if one could make merely a section of part of the pupillary ring of the iris without removing any substance, that would be better still. This was aimed at by Bowman, who used a blunt pointed knife, pushed behind the iris and cut forwards with it, and by others, notably de Wecker, whose *pince-ciseaux* have one blunt pointed blade which can also be introduced behind the iris and the scissors then closed. Such procedure is, however, necessarily attended with no little danger to the lens. Seeing these dangers, some other surgeons have attempted præcorneal iridotomy, which consists in bringing the iris through a wound in the cornea, and there incising it. Czermak disapproves of the method inasmuch as the iris which is drawn out is allowed to return to the eye and may thus convey sepsis; but Manolescu strongly recommends it, and even performs iridotomy in preference to iridectomy in the course of extraction of cataract. If the hook is used to draw out the iris the operator must

remember that whether he incises the iris to one side of the hook or the other the resulting aperture will not be opposite the centre of his corneal incision: this may be of importance where much opacity exists in the cornea. Axenfeld adopts a slightly different procedure; he makes his small incision, and then by gentle pressure on the posterior lip of the wound induces a prolapse of the iris; this he then incises by a quick radial scissor cut, carefully replaces the iris, and the operation is finished. The incision, if the procedure has been successful, affects from one-half to two-thirds of the width of the iris. At first, until the aqueous gathers again, the lateral separation of the lips is very small, but by and by it widens. It would probably not be wise to attempt the operation according to this method in presence of a semi-dislocated lens, lest vitreous should protrude in place of iris; to employ the hook would be better. The present reviewer can speak well of the operation from personal experience.

W. G. S.

SPIELMAYER. The Neuroglia in Tabetic Optic Atrophy.

FROM the examination of the atrophied visual nerve paths in a case of tabes by Weigert's method, the writer found that the appearances presented by the neuroglia closely resembled those present in other parts of the central nervous system, *e.g.*, in the posterior tracts of the spinal cord. The changes in the neuroglia along the optic nerve, tract, and chiasma consist in an enormous increase in the number of the fibres, rarely in the size of the individual fibres: they are wavy in their course, and although often united into bundles are never fused together, but remain distinct from each other. There is no proliferation of the nuclei; on the other hand, they exhibit all forms of retrogressive changes; very few astrocytes are met with.

As regards the general arrangement of these fibres in the nerve and tract, they run in two main courses—one circular (as seen in cross sections), and the other longitudinal, an arrangement which follows that of the supporting connective-tissue proper. The former surround the spaces formerly occupied by the atrophied nerves fibres, while similar bundles enclose the perivascular spaces and are connected by off-shoots with the fibrous tissue lying in them. The peripheral neuroglia mantle

is also markedly thickened; the fibres of it form a close meshwork and throw off numerous small bundles to form an intimate connection with the surrounding pia mater. The longitudinal fibres, which comprise the bulk of the new growth, run mainly parallel to each other, although they sometimes cross or even become interwoven, this network arrangement being most marked in the chiasma.

The primary optic centres in this case were not systematically examined, only parts from the pulvinar, external geniculate body and the central gray matter of third ventricle being taken. In these parts the type of neuroglia proliferation was similar to that found in secondary degenerations, viz., a dense network formed for the most part by astrocytes. But besides these a few large spider cells with long processes in close relationship with neighbouring blood-vessels were seen, and as they are more characteristic of primary degeneration, the writer concludes that in some parts of these subcortical optic centres there is also evidence of primary degenerative changes. The presence of both primary and secondary degeneration in these centres leads him to offer the suggestion that while nerve fibres from the retina end in them they may also be the origin of centrifugal optic fibres. But although his results from this case do not afford any proof of this, he thinks that the study of the neuroglia may possibly add to the results of the degeneration methods in the more obscure centres.

THOMAS SNOWBALL.

GRAFENBERG. **Obstruction of the Central Artery with Escape of Papillo-Macular Area.** *Archiv für Augenheilkunde*, April, 1906.

GRÄFENBERG records two cases in which the escape of the papillo-macular area might have been attributed to the existence of a cilio-retinal artery, but which, in his opinion, were not due to this cause, seeing that the vessel simulating a cilio-retinal one was seen to partake in the general shrinking of all the retinal arteries, and after a week or so was no longer visible. In these cases therefore the vessel which was apparently cilio-retinal was really a branch of the central artery proceeding from some way higher up than its emergence from the disc. The area in question was probably partly supplied by this, and

partly by small cilio-retinal twigs invisible to the ophthalmoscope. Its colour gradually became indistinguishable from that of the rest of the fundus, but its function remained, while that of the rest of the retina was lost.

A. H. T.

HILBERT (Sensburg). **On a Case of Conjunctivitis and Erythromelalgia.** *Wochenschrift für Therapie und Hygiene des Auges*, 1906, No. 25.

THE condition was seen in a woman, aged 45 years. She suffered acute pain and marked hæmorrhagic swelling of the eyelids, the tips of the finger and toes. From the conjunctiva issued a mucous discharge. Treatment of the conjunctiva with antiseptics increased the disorder, but relief was gained, both for eyes and extremities, by the use of cold compresses. Hilbert agrees the case was one of angioneurosis, probably dependent on a blood disorder, and he refers to cases of the same order, though uncomplicated by conjunctival catarrh. The coincidence of this catarrh with the erythromelalgia he thinks unique, but his remarks on the treatment of the case seems to indicate that there was no real inflammation of the conjunctiva, but only an exaggeration of the normal secretion induced by the abnormal vascular conditions.

N. BISHOP HARMAN.

DE MICA (Toulouse). **On the Importance of Early and Systematic Examination of Injured Eyes, and the Advantages to be Gained by Assurance Companies by the Employment of Medical Inspectors.** *Recueil d'Ophthalmologie*, March, 1906.

COMMENTING on the difficulties frequently met with in adjusting the claims of workmen for compensation for injury sustained to eyes owing to the prevalent feeling that assurance companies—since they have to earn dividends—are necessarily antagonistic to the workmen, Mica puts in a plea for the early and systematic examination of any injury of the eye by a medical expert, and the lodgement of a report at the local court of law where such claims are adjusted.

He puts his propositions thus:—

1. There should be delivered within 48 hours of an accident a formal statement.

2. Such certificate should suggest to the magistrate, when the wound appears sufficiently serious, the necessity for a later enquiry.

3. The treatment of the disorder.

4. To furnish the court—in the quality of a medical expert—with a detailed report on the state of the injury and the consequences of the injury.

Mica believes that such a system of prompt examination and notification would eliminate many of the troublesome disputes arising from differences of opinion as to whether certain conditions, noted after the lapse of some time from the date of the injury, were the result of the injury or existed before it. There is no doubt that this determination might be made in many cases, but it is recognised by the author that the early onset of oedema in severe injury might completely prevent examination of the eye and invalidate any prognosis.

It would seem that difficulties of this nature would be better avoided by forestallment, by the systematic examination by experts of the eyes of workmen engaged in hazardous tasks at the time of their engagement by an employer. The value of a man's vision would be definitely known, his capacity, with the vision he has, of doing this or that work accurately judged, and in the event of mishap the deterioration of his vision would be readily assessed.

The reviewer knows of one case where such an examination, made in the ordinary course of work by an impartial hospital surgeon, proved that a defect of vision asserted by a workman to have been the consequence of an accident had existed a year before the accident, and was simply a congenital astigmatism. In this case the assurance company was saved an action at law and possibly heavy damages.

N. BISHOP HARMAN.

FRANZ BECKER (Düsseldorf). **New Points of View of the Atropine Treatment of Myopia.** *Wochenschrift für Therapie und Hygiene des Auges*, 1906, No. 23.

BECKER gives details of two cases in children,—one æt. 12 years, the other æt. 14 years. The results do not seem to lend much

support to his belief in the utility of atropine in reducing the liability to a progress myopia. In one case myopia increased from $-2.5D$ to $-6D$ in $5\frac{1}{2}$ years; in the other from $-4D$ to $-6.5D$ in $3\frac{3}{4}$ years. He discusses the rationale of the treatment, and develops a most ingenuous argument on the origin and development of myopia. He puts aside the influence of excessive convergence, for, he says, disturbances of the extra-ocular muscles are only manifest in the later stages of myopia, but ciliary spasm is recognisable early in the disease, and on this spasm he fixes as the true cause. A tonic spasm of the ciliary muscles, he believes, throws a constant strain on the choroid to the full extent of its elasticity, and in this state the choroid is subjected to the normal pressure of the vitreous which tends to fix it in its stretched condition. This alteration of the choroid tends to produce a partial venous stasis within it and in the *venæ vorticosæ*, and consequently a softening of the sclera and an axial myopia. He argues that the ciliary muscle of man has an action, beyond that commonly recognised in accommodation, in that it takes the place of a well-developed tensor of the choroid found in vertebrates with an elementary accommodation mechanism. The use of atropine, he believes, relieves the choroid from the state of passive stretch, allows its elastic fibres to regain their normal tone, and with the return of ciliary action there is renewed this secondary *vis-a-tergo* action on the venous flow. Now, he says, comes in the benefit of a full correction of an error of refraction—the artificial restoration of emmetropia provides the normal scope of ciliary work, the choroid is regularly stretched and relaxed, the venous blood flows on easily, and the nutrition of the sclera is restored.

The argument is most ingenious. It, however, fails to convince on two grounds—first, because of the weakness of the two cases he details; and, secondly, for the reason that if his view of the action of the movements of the ciliary muscle on the choroidal circulation were true, then the use of atropine for long periods—even to one year, in the attempt to recover vision in the amblyopia of squint—should be disastrous, but experience shows it is not.

N. BISHOP HARMAN.

WOPFNER (Innsbruck) **A Case of Metastatic Panophthalmitis, following on a Croupous Pneumonia in a Patient after Cataract Extraction; Infection by Friedländer's Pneumo-Bacillus.** *Klinische Monatsblätter für Augenheilkunde*, April-May, 1906.

DR. WOPFNER adds to the somewhat scanty literature of metastatic panophthalmitis, describing the pathological changes in detail which occurred in a very severe case which terminated fatally. Five days after extraction of an uncomplicated senile cataract the patient developed an acute croupous pneumonia. All the signs of a purulent exudation in the vitreous were present: the corneal wound was not infiltrated, and the anterior segment of the eye showed comparatively little change. The general condition of the patient gradually became worse, and he died ten days after the cataract operation. The post-mortem appearances confirmed the diagnosis of lobar pneumonia, the affected lung giving a pure culture of Friedländer's pneumo-bacillus. The interior of the eye was pervaded by a fibrinous and purulent exudation. The most severe inflammatory reaction was found at the papilla and in the retina around, where obviously the focus of infection occurred. The appearances were those of a purulent retino-choroiditis. Pneumobacilli were found in the exudate, most numerous in the posterior focus, but also diffused throughout the whole uveal tract. They lay around the vessels in the meshes of the connective-tissues, not in the lumen of the vessels themselves.

Wopfner rightly points out that the evidence clearly indicates a metastatic, and not a wound, infection. The condition of the croneal incision, and the normal state of the conjunctiva, would alone have been sufficient without the positive evidence obtained from the sections. Wopfner's findings agree with those of Axenfeld and Herrenheiser in similar cases; the organisms pass out of the vessels through a diseased endothelium, and the infection thus commences as a perivascularitis: the site of infection can therefore be determined by the dense arrangement of the bacilli around the vessels at this point, while throughout the eye they are scattered less thickly in the exudate. In the case under consideration Wopfner considers that the operation may have lowered the resistance of the eye somewhat, although he does not indicate how that can have taken place, nor does he give any evidence in support of his suggestion. A bibliography accompanies the article.

ANGUS McNAB.

E. H. OPPENHEIMER (Berlin). **Methods of Marking the Axes of Cylindrical Lenses.** *Wochenschrift für Therapie und Hygiene des Auges*, 1906, 25 and 26.

OPPENHEIMER tells how he once ordered two cylindrical lenses—one axis 70° , the other axis 115° , and on examining the spectacles subsequently found that the optician and himself did not agree on the meaning of the formula described. He then considers at some length the many and variant methods of ordering these lenses now in use, their advantages and disadvantages. There is no doubt that the present manner in which each surgeon uses that scheme which is most right or easy in his own eyes, creates a nuisance, only mitigated by our general practice of graphic representation of the desired axis on a chart. If all countries could agree on a dioptric scale of lenses and relegate their venerable and diverse focal-inch scales to a profound limbo, surely we can agree on so simple a matter as this. Could not our Ophthalmological Society try?

————— N. BISHOP HARMAN.

G. WERNICKE. **The Operative Treatment of Detachment of the Retina.** *Klinische Monatsblätter für Augenheilkunde*, February and March, 1906.

WERNICKE has made an experimental study on rabbits of various operative methods that have been used in the treatment of detachment of the retina and controlled the clinical results by microscopical examination. These methods included scleral puncture combined with subconjunctival injections, galvano-cautery, electrolysis, and injections into the vitreous. As regards intraocular injections, the employment of more or less indifferent fluids, such as physiological salt solution, vitreous or aqueous fluid, is of little value because, on the one hand, they are absorbed so quickly that they cannot exert any continued pressure on the retina against the choroid; whilst, on the other, their tendency to set up an inflammatory action in the choroid is no more than might be expected from the puncture itself. He also deprecates the injection of all substances that produce an inflammatory reaction in the vitreous, such as tincture of iodine, or the vitreous of rabbits or calves (as used by Deutschmann, whose method he subjected to close examination), the result of such injections being to induce a small-celled infiltration and ultimate shrinking of the vitreous, while the choroid is apparently not affected till very late and the inflammation may extend beyond the area in which its action is desired and

possibly lead to the destruction of the globe. Deutschmann's success he would attribute to his preliminary incision of the globe rather than to the injection of the vitreous. Electrolysis has, in his opinion, little to recommend it, because it may set up serious changes in the vitreous while the amount of adhesion it produces is not more than may be got from simple scleral puncture; moreover the beneficial action on the metabolism of the eye that is claimed for it is held to be problematical.

The application of the galvano-cautery to the sclerotic is the method by which Wernicke considers one can obtain the most extensive adhesion of choroid and retina. Its action may be increased by puncturing the sclerotic in several places, and also perhaps by the use of subconjunctival injections of salt solution for the purpose of accelerating the absorption of the subretinal fluid and stimulating the intraocular metabolism. In this connection he points out the disadvantage and possible dangers attending the use of strong solutions of salt (30 per cent.), viz., pre-retinal hæmorrhages, adhesion between the conjunctiva and sclerotic with subsequent obliteration of their vessels, obliteration of Tenon's space and even necrosis of the conjunctiva. Uthoff uses the method of cautery and puncture as follows:—The conjunctiva is incised between two recti and as far as possible over the area of the detachment, and with a scissors a way cut backwards in the episcleral tissue, keeping close to the globe. The end of the cautery is pushed as far back as possible and the sclerotic over the detachment cauterised in one or two places, and the cautery withdrawn. The wound in the conjunctiva is closed with a catgut suture, and then two or three punctures are made with a Knapp's discission knife so as to let the subretinal fluid emerge under the conjunctiva.

At the end of the paper a short account is given of 14 recent cases of retinal detachment from the Breslau Clinic that were permanently cured; but out of the total number of cures observed in that clinic the percentage of those that occurred without any treatment or were effected by rest was apparently greater than that of those obtained by operative measures.

THOMAS SNOWBALL.

Prof. W. GOLDZIEHER and MAX GOLDZIEHER (Buda-Pest). **The Pathological Anatomy of Trachoma.** *Archiv für Ophthalmologie*, 1906, lxiii., 2.

THE authors describe in great detail the microscopical anatomy of pieces of conjunctiva removed from patients suffering from

trachoma in different stages. The epithelium was found to be normal in some places, but elsewhere thickened. Goblet cells were common, not only in the superficial layers, but also deeply situated. The epithelium dipped down between the papillæ, and invaded the deeper tissues for some little distance. These columns showed a lumen often filled with multi-nucleated leucocytes. Islands of epithelium were also seen close to these processes, and were no doubt connected with the surface epithelium.

The cells of the subepithelial layer consisted chiefly of lymphoid cells with many large mononuclear leucocytes. Between each finger-like down growth of the superficial epithelium there was a vascular papilla, and around the minute vessels of the papilla were seen numbers of plasma cells and a few leucocytes. The plasma cells formed a sort of mantle to the blood-vessels, lying often directly in contact with the endothelium. Mast cells were also found not only in the periphery of the granule, but also in great abundance in the loose tissue about the fornix. The fate of the granule depends entirely on the fate of its cell elements: these cells in time always show regressive changes with nuclear degeneration. Cicatricial changes occur more or less in every case. Neither lymphocytes nor plasma cells are able to form connective-tissue; for this formation fibro-blasts are essential. These fibro-blasts almost certainly originate from the walls of the blood-vessels. Sections stained by Van Gieson's method showed how the connective-tissue sheath first formed around the blood-vessels, where the cells were most numerous, and then invaded the granule. From this it appears evident that early expression by destroying the small vessels may prevent to some extent the subsequent formation of scar tissue.

The importance of the blood-vessels cannot be accentuated too much in trachoma. Most authors, excepting Junius, ignore it. In all chronic inflammatory processes, such as tubercle, syphilis, etc., a small round-celled infiltration is constant. In all the infective granulomata, and often in the carcinomata, plasma cells are found.

The authors come to the conclusion that trachoma is due to some unknown special irritant localised to the small blood-vessels of the conjunctiva. The virus first attacks the vessel wall; a round-celled infiltration follows, going on to the formation of the typical granule. After the poison is exhausted

the perivascular thickening subsides, fibro-blasts escape from the vessel wall, and scarring commences. The article is very complete, and although it does not carry us very far towards the discovery of the trachoma virus, has its own value.

The text is accompanied by fourteen excellent reproductions of the microscopical appearances.

E. W. BREWERTON.

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CATARACT EXPRESSION IN THE CAPSULE
(SMITH'S OPERATION).

RESULTS IN 175 OPERATIONS.

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EVERYONE must agree that Major Smith's name should be associated with removal of a cataractous lens in its capsule entire. Though all surgeons who have done many cataract operations have, I take it, removed over-ripe lenses in much the same way, Major Smith must be credited with having been the first to advocate the adoption of this as a routine method, and by the introduction of important improvements in technique he has made it an operation *sui generis* not to be confounded with that known as Pagenstecher's. This confusion has been repeated in some criticisms of the operation that have appeared in various journals recently. Pagenstecher's operation is extraction of the lens in its capsule by means of a scoop or spoon passed in behind the lens, and is, as far as I can ascertain, the operation performed for some years in the Eye and Mayo Hospitals in Calcutta by Surgeon-Major N. C. Macnamara, I.M.S., now of the Royal Westminster Ophthalmic Hospital. Smith's operation is expression of the lens in its capsule without the use of any scoop. Pagenstecher's causes only slight increase of intra-ocular pressure, but entails almost certain prolapse of

vitreous. Smith's causes considerable increase of pressure until the lens begins to come out, and in a large proportion of cases prolapse of vitreous also. The operations are as different, therefore, as they can be, and Smith's is original in technique, though founded on the old observation that prolapse of vitreous is by no means always followed by a poor result in cataract extraction. The term *expression* of cataract describes this operation better than *extraction*, and should, in my opinion, be used for it.

Many natural objections to the operation, combined with indifferent results in the few such operations performed, prevented me from giving the method a thorough trial. Having seen Major Sunder perform it, however, I was led to "take one's courage in both hands," as he put it, and the result has been 175 operations of the kind, which are analysed in this paper. The objection to the conclusions drawn may be raised that, as I have not seen Major Smith perform his operation, the operation performed may not really have been his. In answer to this, I would say that the directions published by him* were implicitly followed (except in the matter of incision (after a short trial of it) and coaxing out the lens, which will be referred to later); that I have seen others perform the operation; moreover, I have had the benefit of hearing from an oculist who had seen me doing it, who had done it himself, and subsequently had seen Smith do it; and he pointed out only one difference in technique, which was altered without influencing the results. As regards care in operating, the average time taken was five to ten minutes, *i.e.*, longer than usual. Major Smith does 20 to 30 in the hour, and along with the operation writes up

* *Indian Medical Gazette*, vols. xxxv., 1900, p. 241, and xl., 1905, p. 327.

the notes. He says, "as regards the records, the bed-head tickets, as far as concerns the operations and the case, are written up in every detail by myself before the patient has been removed from the table." Dictating the notes myself, I find it difficult to get through more than 12 to 15 cataracts an hour, not working against time of course. These remarks are made with the object of showing that undue hurry in expression was not the cause of the vitreous prolapses and capsule ruptures met with.

The results as regards the operation and its complications will first be dealt with, and then some conclusions will be drawn.

THE OPERATION.

Incision. In Smith's paper published in the *Indian Medical Gazette* for September, 1905, he says: "I . . . cut out in the cornea with a sweep half-way between normal pupil and the sclero-corneal junction," *i.e.*, make the incision well forward in the cornea, and in 1900 he made the incision in the same way. This was done in some of my earlier cases, but it was soon given up, and the usual corneal incision parallel to the plane of the iris, with a conjunctival flap, was reverted to. Major Smith has also given it up I understand, and in his last letter to the *Indian Medical Gazette* (April, 1906) says:—"This operation can be done just as well with one incision as another." I cannot agree with him in this, as the incision originally recommended by him, but now given up, is a bad one as regards later results, though it facilitates expression at the time. It gapes for days and often epithelium grows into it, interfering with healing so that a weak scar is left, taking some time before the epithelium is extruded and the scar becomes strong. The amount of astigmatism left

is also much greater with such an incision (*v. infra*). Iridectomy was performed in all the cases in the series, and atropine was instilled before operation. These aids to expression appear very necessary.

Expression was slowly brought about by pressure with the convexity of the strabismus hook near the lower margin of the lens and counterpressure with the back of a spoon applied just above the edge of the wound, as directed by Smith in the paper above referred to. In April, 1906, he speaks of having stopped pressing on the ciliary region or post-ciliary region because it favours retinal detachment. But if counterpressure is not to be applied there, where is it to be applied? Without it expression or extraction is much more difficult, and it is hard to understand how counterpressure there is to be held responsible for detachment. That is far more likely to be due to loss of vitreous support on which the retina has to rely for remaining in place. The retina is not as Smith says: "organically attached" to the coats of the eye on which it rests, as might have been ascertained from simple observation or from any text-book.

An interesting point bearing upon the anatomy of the lens may be mentioned here. After the lens in its capsule has begun to bulge through the wound it not infrequently happens that a fine transparent membrane appears to give way in front of it—this fine membrane is adherent to the posterior surface of the iris, and its giving way facilitates the passage of the lens. In such cases the capsule rarely bursts and the vitreous rarely prolapses. Perhaps it is a superficial layer of the thickened capsule of an overripe lens, though it gives the impression of being a definite membrane, and it gives way over the advancing lens just as the membranes may be seen to give way over an advancing

fœtal head. It cannot be the hyaloid which lies behind the lens and remains unruptured in such cases, and it behaves like an outer capsule. The existence of a definite hyaloid membrane behind the lens which has been disputed (see Parsons, "Pathology of the Eye," vol. ii., p. 428), is apparently decided in the affirmative by the course of events in this operation.

The above reference to fœtal membranes reminds one that there are several features of this operation recalling labour and making the *simile* not so absurd as it seems at first sight. The incision, like the os uteri, must be large enough and the expression should be slow. The upper edge of the lens must tilt forwards just as the head must present properly. With much resistance a *caput succedaneum* forms, and if the lens is large, or the incision relatively small, the lens becomes moulded and a distinct sulcus forms on it at the line of pressure. If labour is rapid the membranes rupture early, and in expression rupture of the capsule is likely to follow haste, though it may occur without. Finally in its passage out the placenta wipes the parts clean and the lens also wipes the wounds in the iris and cornea clean—one of the advantages of this operation.

Two aids to expression may be mentioned which have been found useful. When the lens is half out it will sometimes be found that neither pressure, nor counterpressure, nor tilting the lens out by getting the edge of it in the concavity of the strabismus hook as recommended by Smith, avails to express it, and the operation seems to come to a standstill. In such cases, while keeping up pressure with the strabismus hook, the lens may be gently coaxed out by means of a spoon applied along the edge with safety, provided the spoon be rounded and not sharp, and great gentleness be used so as not to rupture the capsule.

The other aid is slowly to slide the counterpressing spoon along the sclera along the outer edge of the wound. If this is done gently the transparent membrane above described may be seen gradually to tear through and the pillars of the iris coloboma to separate, and the lens will then come out quite easily. Neither of these manœuvres was found to increase the complications.

Toilet. If prolapse of vitreous did not occur the pillars of the iris coloboma were stroked into position. They were found more often in the wound than in ordinary extractions, as would be expected from a larger mass having to be pressed out through the wound. The lids were then closed and wiped with pledgets of wool and pads of gauze and wool applied. If the capsule ruptured during expression an attempt was made to remove it with dissecting forceps, the attempt seldom being completely successful. Failing removal of the capsule some cortex was usually stroked out, but such eyes were regarded with apprehension—the eye having been subjected to pressure without the desired result having been obtained, and the anterior chamber remaining full of cortex and displaced capsule. The results in these cases will be given later.

COMPLICATIONS.

Rupture of the capsule. This occurred in 30 cases, or in 17·14 per cent. There were 10, 7, 9, 4 in successive fifties (only 25 in the last group). In 5, 1, 3, and 1 (total, 10 out of 30), there was prolapse of the vitreous as well. Three of the prolapses were slight, four were moderate, and three large. Smith gives 8 per cent. of ruptures, which is low, compared with the above.

When the capsule ruptures, some capsule and cortex usually remain behind. The cortex may be absorbed,

and needling will assist this if necessary. Capsule is not absorbed however, and its presence, loosened from its surroundings, is a dangerous complication. How dangerous all surgeons with any experience know, and those who do not may learn from Parsons' work, already quoted, and from Treacher Collins' paper on the subject. When entangled in the wound, as it seems more likely to become on being ruptured in this way, the danger is great. It may be mentioned that during the series the attempt at expression was abandoned in eight cases, as the amount of pressure required was considered unjustifiable. The attempt did not appear to have injured the eye in any way, as all the eyes obtained good vision. In one only there was keratitis, and healing was delayed by iris becoming fixed in the wound. Rupture of the capsule injuriously affected the resulting vision. Of the 29 cases, 22 gave good results, including six in which needling was performed. Five gave indifferent results and two ended in total loss of vision: one from suppuration and one from opacity of the cornea and low tension. In the 145 cases where the capsule did not rupture, there were 138 good, 4 indifferent, and 3 bad results, *i.e.*, more than half the indifferent and nearly half the bad results of the whole series were in cases in which the capsule had ruptured.

Prolapse of the vitreous. In the 175 expressions the vitreous prolapsed 67 times, *i.e.*, in 38.28 per cent. In successive groups there were 21 prolapses in 50 expressions, 21 in 50, 17 in 50, and 8 in 25. Eleven of the prolapses were large, 34 were moderate, and 22 were small in amount. Thirty of them occurred before the lens, five with it, and thirty-two after it. During the time these operations were being performed five cases were met with in which the patient squeezed out lens and

vitreous together without assistance the moment the incision was completed. These cases have not been included in the figures. There were also six cases among those now analysed in which vitreous bulged into the wound, but did not prolapse or require cutting off. These have not been included among the prolapses. The usual percentage of vitreous prolapse in cataract extractions may be taken to be about 5 per cent. Galezowski recently gave his prolapses at 4 to 5 per cent. In a paper I published in the *Indian Medical Gazette*, Vol. xxxviii. (1903), on the results in a series of 1,000 consecutive cataract extractions there were 68 expressions in the capsule, and in these 68 there were 33 prolapses of vitreous. All were overripe lenses in tough capsules, which bulged into the wound and offered themselves as it were for expression. Excluding these there were in the remaining 932 extractions 59 prolapses of vitreous, or 6·3 per cent. In the last 1,000 extractions in my note-books the percentage has been 4·3. Taking 5 per cent. as the average, therefore, that may be expected, this means that in this series of 175 expressions there were 67 prolapses instead of 9. Smith gives his percentage of prolapses in 2,616 expressions as 6·8. This means 177 prolapses, and in only nine of these, he says, did more than a bead of vitreous escape. This, too, in a series which included 75 cataracts that had already been couched by *rawuls*, although it is nearly always found in such eyes that the vitreous is fluid and prolapse is inevitable, as the hyaloid has already been ruptured. As regards results, the vision in 108 cases in which there was no prolapse was good in 100, indifferent in 6 and bad in 2, compared with 62 good results, 3 indifferent and 3 bad results in the 67 cases where vitreous prolapsed. Of the 62 prolapse cases resulting in good

vision, 33, or more than half, saw $\frac{6}{18}$, or more with glasses. Of the 100 cases without prolapse obtaining good vision, 69 saw $\frac{6}{18}$, or more with glasses. These figures do not reveal any very striking differences between the cases with and those without prolapse. They do not represent the final outcome of the operation, however, as it is reasonable to assume further deterioration of sight in some of them after prolapse of vitreous. It is surprising, no doubt, what good vision is obtained after even large prolapses of vitreous, and how soon tension is restored. But in many cases such tension comes back only slowly, in others the vitreous remains exposed in the wound for some days before it becomes soundly healed over, and in all cases access for infection to the interior of the vitreous chamber is provided at the time of operation. The question of frequency of detachment of the retina can hardly be decided in this country, where it is so difficult to follow up cases. But it would require a considerable series of such operations, carefully and repeatedly examined and found free from subsequent detachment or degeneration, to convince one that vitreous prolapse is a negligible complication in cataract extraction. Still stronger must the proof be in cataract expression, where the force used is necessarily greater. Such proof we have not yet, beyond the facts that Major Smith still does the operation and the Punjabi still comes to have it done. Were the Punjabi patients mathematicians and scholars, the proof might be considered enough.

Iritis was found only three times, in one of which cases the capsule had ruptured. Iritis was therefore rare, as claimed by Smith.

Iris prolapse occurred five times, and three times it was found healed in the wound. This is above the average,

but to be expected in operating under such conditions, as explained above under the heading "Expression."

Keratitis. There was haziness of the cornea in 19 cases, varying in degree and coming on a few hours after operation. It cleared up in all except two, in which the cornea remained opaque (*v. infra*). The haziness appeared to be due in some cases to the pressure of the stabismus hook, and in others to bruising from the lens in its passage out. In one case there was an abrasion of the cornea which may have been due to cocain (Alypin was the anæsthetic used in more than half the cases).

Delayed union of the wound. Delay in union was met with in seven cases, and this in spite of six of them having conjunctival flaps, with which addition in ordinary extractions delayed union is almost unknown. In three of the seven epithelial ingrowth occurred, and in one of these infection followed, and the result was a failure.

RESULTS.

Vision. There were 162 good, 9 indifferent, and 5 bad results in the 175 cases recorded. Of the 162 good results 115 obtained, with glasses, vision varying from $\frac{6}{24}$ to $\frac{6}{6}$, 55 of them being in the $\frac{6}{12}$ class. Of the 115 referred to above 41 were cases that had had prolapse of vitreous, which makes 61·2 per cent. on the 67 such prolapses met with; 74 of the 115 had had no prolapse, or 68·5 per cent. In other words, 68·5 per cent. of cases without prolapse obtained such good sight compared with 61·2 per cent. of the cases having prolapse.

Of the indifferent results three were not in any way dependent on the operation, two being found subsequently to have optic atrophy and one retinitis pigmentosa. Of the remaining six indifferent results, in four it was mainly

due to rupture of the capsule, and needling might have improved matters. In one of the four vitreous prolapsed also. In the remaining two cases, although no complications occurred at the operation, the eye remained red, painful, and slightly chemosed for some time after; in one case for a month, and in the other for a shorter time, and sight was never good though no other reason for this was found. In one of these cases the pupil became drawn up so that the eye looked as if there had been a prolapse of vitreous, though there had not been. This phenomenon was met with in four other cases also where no prolapse of vitreous had happened and where there was no iritis to account for it.

The notes on the five cases ending badly were as follows: (1) vitreous prolapsed before lens, vectis used, capsule ruptured, lymph appeared in anterior chamber three days later and eye was lost; (2) vitreous prolapse, next day striated keratitis and iris in the wound; lymph appeared and the eye was lost from suppuration; (3) a case of old trachoma, vitreous preceded the lens, vectis used; striated keratitis next day and eye soft. Twenty-six days after eye still very soft and tension -3 , cornea diffusely hazy, pupil dilated, $V=p.l.$ only. The other eye, extracted eleven days earlier, with iridectomy and irrigation, did well and obtained good sight; (4) no complications at operation, wound gaped for a month in spite of a small conjunctival flap and lymph appeared in *it*, not in the anterior chamber; tension remained low and cornea hazy; $V=$ hand movements only; (5) capsule ruptured, tension remained low and cornea became opaque; $V=p.l.$ only. No sign of inflammation about the eye.

None of these bad results should have occurred, and if the two which became septic be excluded, though it is

doubtful if they should be as in one the capsule ruptured and in the other vitreous prolapsed—both complications favouring infection—the remaining three failures can be directly attributed to the method of operation. Of the indifferent results six may fairly be so attributed.

In 33 of the cases it was possible to compare the sight in the expressed eye with that of the other operated upon in some other way. In 15 of these the vision was better in the “extracted” eye, in seven it was better in the “expressed” eye, in ten it was equal in the two eyes, while in one case already referred to, the expressed eye failed from haziness of the cornea and low tension, the extracted eye obtaining good sight. In one of the 15 eyes referred to above the better eye was one that had been “couched” $1\frac{1}{2}$ years previously; the sight in it was $5/_{12}$ compared with $5/_{18}$ in the expressed eye. In all the rest ordinary extraction had been done (with iridectomy in all but three). The difference in sight usually amounted to the patient reading one line lower with the better eye. In one patient in whom both eyes were expressed the sight was better in the eye in which no complication was met with than in the other in which vitreous prolapsed.

2. *Cosmetic appearance.* Though I am not inclined to lay stress upon this, there can be no doubt about the unpleasant appearance if there has been vitreous prolapse. In such the pupil often lies behind the upper half or third of the cornea, and the eye looks uncommonly ugly, particularly if the iris be blue or light-coloured. In all cases the pupil tends to be larger than after extraction.

3. *Astigmatism.* With a forward incision as at first advocated by Major Smith, and done by him in about 9,000 cases, astigmatism is great. In three such cases it amounted to 7, 15, 15 dioptries, tested with the ophthalmo-

meter, and this incision was given up at once (as it since has been, I understand, by Major Smith himself), for this and other objections already given. If the incision is made the same as in ordinary extraction, *i.e.*, with a conjunctival flap, the astigmatism is about the same after extraction and expression. Without a conjunctival flap it is a little greater.

CONCLUSIONS.

The *advantages* of the operation are (1) only one instrument besides the knife—the iris forceps—is introduced into the interior of the eyeball, and so there is less chance of infection, especially as the piece of iris touched by the forceps is removed; (2) complete removal of capsule and cortex, and so better vision, with removal of one of the main causes of indifferent sight after extraction and of one of the minor causes of iritis. Impaction of capsule in the wound, with all its dangers, is avoided also.

The *disadvantages* of the operation are (1) frequent loss of vitreous with its dangers of detached retina, hæmorrhage, increased chance of infection, etc. (2) prolonged lowering of tension and haziness of the cornea with poor vision: this may occur without prolapse of vitreous; (3) delayed union, which may occur even with a conjunctival flap and with a peripheral incision, due to the pressure applied; prolonged redness, lacrymation and chemosis, with drawing up of the pupil, are apt to be found in such cases; (4) frequent rupture of the capsule with its bad effect on vision.

In face of these grave drawbacks, it is impossible to recommend the performance of the operation, and personally I have returned to the practice of removing lenses in their capsules only when they are overripe and have

thick capsules; to those cases, in fact, in which I have generally removed the lens in its capsule years before this operation was heard of.

It is futile, as well as arrogant, to compare his operation to litholapaxy, as Major Smith has done. The comparison suggests that those who do not practise it are neglecting their duty to their patients; in fact, are wilfully performing an inferior operation upon them. The deliberate, and I believe unprejudiced, pronouncement of the three Presidency ophthalmic surgeons of India,* one after another, against the operation should go far to make men pause before adopting an operation for which such extravagant claims have been made, and in which such manifest dangers are incurred.

I have to thank Assistant-Surgeon Surendra Nath Ghosh, I.M.S., House Surgeon of the Eye Infirmary, for much assistance in the care of the patients whose cases form the subject of this paper.

* See papers by Major Herbert, I.M.S., Bombay, and Major Elliott, I.M.S., Madras, in *Indian Medical Gazette*, Feb. and May, 1906.

REVIEWS.

E. E. HENDERSON and E. H. STARLING. **The Factors which determine the production of Intraocular Fluid.** From the Physiological Laboratory, University College, London. *Proceedings of the Royal Society, B.*, Vol. 77.

NUMEROUS researches have been made on the seat and mechanism of production of intraocular fluid, but considerable diversity of opinion still exists on several points. The paper before us contains the results of experiments carried out by Henderson and Starling, "with a view of determining the weight to be ascribed to different experimental investigations."

Authorities are generally agreed that the formation of intraocular fluid is effected by the ciliary processes, and that by far the greater part of this fluid passes through the pupil into the anterior chamber; at the angle of this chamber it is passed under pressure into the canal of Schlemm and carried away by the venous system.

Ehrlich suggested, and offered some experimental evidence to show, that an appreciable amount of intraocular fluid may be secreted directly into the anterior chamber by the anterior surface of the iris. The authors agree with Leber, that Ehrlich's experiments prove the possibility of diffusion between the vessels of the iris and the anterior chamber, but not the secretion of a normal intraocular fluid.

The important question concerning the formation of intraocular fluid is whether it is the result of secretion by the cells covering the ciliary processes, or is a transudation similar to lymph, and dependent upon a process of filtration through the blood-vessels and the epithelium covering the ciliary processes. The authors note that the question is in many respects analogous to that concerning the secretion of urine. In each case there is a possible source of transudation in the capillary blood-vessel network and also an absorbing mechanism.

We give very briefly the chief results arrived at by the writers (omitting all description of their methods of research) and the "summary of conclusions" with which they end their interesting paper.

Investigating the effect upon the rate of production of the fluid, of alteration in the blood pressure in the vessels of the eyeball, the authors found that in every case a rise of intraocular pressure caused an increase in the amount of fluid secreted.

In a series of six experiments, the amount of fluid produced, under normal conditions, showed considerable individual variation, the lowest being represented by 5, the highest by 15 cubic m.m. per minute.

Experiments, two of which are given in tabular form, showed conclusively that the rate of absorption of intraocular fluid is determined (in the absence of any disturbing factors) solely by the height of intraocular pressure.

After repeating Niesnamoff's experiments to determine the blood pressure in the capillaries of the eyeball, Henderson

and Starling conclude that his statement, that the normal pressure is about 50 m.m. of mercury, is erroneous, and that his result must be regarded as accidental. Their observations tend to support in every particular Leber's view, that the intraocular fluid is produced by the ciliary processes solely by filtration, and that the amount is determined by the difference in pressure between the blood in the capillaries and the fluid in the eyeball. In 20 experiments the authors found that the smallest difference between arterial blood pressure and intraocular pressure was 48 m.m. of mercury, and the average difference 85.8 m.m. This probably justifies the assumption that there is a difference of at least 30 m.m. of mercury between the capillary blood pressure and the intraocular pressure, a difference which would satisfy the necessary conditions for filtration.

The effect of the size of the pupil on the absorption of intraocular fluid was investigated in animals whose one eye was treated with atropine, and the other with eserine. Under normal intraocular pressure absorption in the two eyes was practically the same, but on raising the intraocular pressure the rate of filtration in the eye under eserine greatly exceeded that in the atropised eye.

SUMMARY.

1. The intraocular pressure represents the pressure at which the rate of formation of intraocular fluid is exactly balanced by its rate of escape through the filtration angle of the eye.

2. The production of intraocular fluid is strictly proportional to the difference of pressure between the blood in the capillaries of the eyeball and the intraocular fluid.

3. No satisfactory method of measuring the intracapillary pressure in the eyeball has been yet devised. Judging, however, from a comparison of the arterial pressures and the intraocular pressures in a large number of animals under different conditions, there is probably always a difference between the intracapillary pressure and intraocular pressure, which is sufficient to account for the production of the intraocular fluid, without assuming any active intervention on the part of the cells of the capillary walls or of the ciliary processes.

4. An increased proteid content of the intraocular fluid

slows its rate of absorption in consequence of the mechanical hindrance of the proteid to infiltration.

5. Filtration, *i.e.*, the absorption of intraocular fluids, at high intraocular pressures is favoured by constriction of the pupil and hindered by dilatation of the pupil. The difference, however, is barely perceptible with normal or low intraocular pressures.

LEBER and PILZECKER. **On Filtration through the Anterior Chamber.** Heidelberg Ophthalmological Congress, 1905.

IN a brief note to the Heidelberg Congress last year, Leber states that as a result of further experiments undertaken with Pilzecker he has come to the conclusion that certain conditions, to which he had previously attached but little importance, do exert a considerable effect on the total filtration of the intraocular fluid as observed by the method he had previously described.

One of these is the temperature of the fluid which is allowed to enter the eye. The lower this temperature is the slower is the rate of filtration. As this is also found to be the case in the somewhat analogous case of filtration through animal membranes, and was also found by the author to occur in eyes *post mortem*, it may in all probability be attributed to the alteration of viscosity in the fluid, and not to any vital action.

The other and more important observation relates to the elasticity of the globe, which the authors, as a result of these experiments, believe to be much less perfect than is generally stated. He found that if any considerable alteration in the pressure of the eye was made during an experiment, the rate of filtration, when the pressure was once more set at the original height was much altered, and took a very considerable time to reach the same figure as before.

On weighing the filtrate under petroleum he found that this difference was accounted for by the slow return of the globe to its original shape. The possible importance of this in connection with glaucomatous tension in elderly persons in whom the sclerotic is more rigid, is noted. In a further note in the *Annales d'Oculistique* for April, Leber promises to give details of the experiments in a later paper in *v. Graefe's*

Archives. In the face of these experiments some modification of our views as to the rate of secretion in the eye, based on observations of the rate of filtration after death, will have to be made.

E. ERSKINE HENDERSON.

A. BIETTI (Padua). **Hypopyon Keratitis resulting from Bacillus Pyocyaneus and Bacterium Coli.** *Annali di Ottalmologia*, 1906, 5 and 6.

THE bacteriological investigation of hypopyon keratitis has already resulted in showing that in the great majority of typical cases of this affection, the exciting organism is Fraenkel's pneumococcus. In a number of cases, however, especially in those atypical forms where the ulceration tends to spread more in depth than on the surface of the cornea, the infection is usually due to one of the more common organisms of suppuration. In another series, however, it has been demonstrated that quite a diverse and varied assortment of microbic agents have been at work. Among those already met with and described in cases of hypopyon keratitis have been Morax-Axenfeld's diplobacillus, streptothrix, the bacillus pyocyaneus, the bacterium coli, etc.

Since Bietti brought before the Italian Ophthalmological Congress at Turin, in 1898, the first case of hypopyon ulcer resulting from bacillus pyocyaneus, several other observers have published similar interesting discoveries.

The author's second case, now under review, relates to a patient, æt. 44, whose left eye was struck by a chip of wood three days before he attended the clinic. A large ulcer then occupied the centre of the cornea and a hypopyon filled the anterior chamber for over two-thirds of its extent. After cauterisation of the ulcer Saemisch's section was performed and the hypopyon evacuated. A few days later a second cauterisation was necessary, and finally, when the ulcer healed, an optical iridectomy was performed. The patient was discharged from the hospital with vision equal to hand movements at two meters.

Bacteriological examination showed a small and actively motile bacillus, which stained readily with all the ordinary basic stains, but was decolourised by Gram's method. The cultures were characterised by the formation of a greenish

pigment. This pigment, pyocyanin, belongs to the aromatic series, and can be easily extracted from the cultures by chloroform. Experimental inoculation into the anterior chamber of a rabbit's eye resulted in the production of panophthalmitis, thus showing the pathological activity of the culture of the organism.

The importance of bacterium coli as a pathological agent in diseases of the eye has been emphasised by various observers, but up to date only two cases of hypopyon keratitis have been published in which this organism was the exciting cause. The first case was published by Zur Nedden, and the second by de Berardinis. In both these cases the eye had to be enucleated in consequence of panophthalmitis supervening, but in the present case of Bietti's the patient, after cauterisation of the ulcer, made an uninterrupted recovery, the hypopyon being completely absorbed at the end of twelve days. In culture media the organism showed all the characteristics of the colon group.

The bacterium was, however, non-motile, even in cultures of less than twelve hours' duration, and showed but little pathological activity when inoculated into a rabbit's eye. This, as Bietti points out, is in accordance with the favourable clinical course of the case from which the cultures were made.

THOMSON HENDERSON.

SEEFELDER (Leipzig). **Clinical and Anatomical Investigations regarding the Pathology and the Treatment of Congenital Hydrophthalmos.** I.: Clinical Observations. *v. Graefe's Arch.*, lxxiii., 2, p. 205.

IN this first part, the author goes into the clinical aspect of the disease. The old story that congenital hydrophthalmos is the result of excessive growth of the eyeball has been almost completely discarded in favour of the view that the complaint is nothing else than infantile glaucoma.

Seefelder has examined anatomically seven eyeballs and has usually found the lens smaller than normal, an occurrence incompatible with the hypothesis of general overgrowth of the eyeball, and in favour of a glaucomatous origin of hydrophthalmus. Diminution in the size of lens has been considered to indicate congenital origin of hydrophthalmos,

and a lens of normal size a point in favour of an acquired condition, but the view that congenital hydrophthalmos corresponds to the primary glaucoma of the adult cannot be adhered to in all cases.

The total or partial obstruction of the iris angle in acquired hydrophthalmos is manifestly responsible for the increased intraocular tension. In congenital hydrophthalmos Reis found in the majority of eyeballs examined anatomically that abnormal conditions existed in the iris angle, causing an obstruction of the filtration and a hindered outlet of the intraocular fluids, but the primary cause of such hindrance to filtration has not been established with certainty. Most authors consider it due to external influences, some attribute it to defective development of the filtrating apparatus, while others, again, seek an explanation for the increased tension in an affection of the sympathetic nerve. A satisfactory solution of this question can be looked for only in cases which exhibit the disease in its earliest stages. Easy as the diagnosis is in a well-developed hydrophthalmos, it is often very difficult, if not impossible, in a very early stage. Photophobia, conjunctival and episcleral injection, and dulness of the cornea are only too apt to lead to the mistaken diagnosis of interstitial keratitis. Just as in glaucoma of the adult, the cornea generally regains its transparency instantly on the reduction of the intraocular pressure by means of paracentesis.

With regard to the beginning of the disease, the author has found that in 9 out of 47 cases observed this was undoubtedly congenital. Other authors have stated that in the majority of their cases the beginning of the disease was not congenital, an observation which induced Schoenmann to propose for these cases the name of "infantile" hydrophthalmos.

As to sex, the interesting fact has been established by all observers that males are affected twice as frequently as females, a proportion directly the opposite of that occurring in primary glaucoma of the adult.

The predominant occurrence of myopic refraction is explained by the considerable elongation of the antero-posterior diameter of the affected eye as a direct result of the glaucomatous increase of the intraocular tension. Though not denying the possibility of a predisposition to myopia of the

hydrophthalmic eye, the author emphasises the fact that he had never in hydrophthalmos found the well-known macular changes of progressive myopia. Vision is generally reduced, often very considerably, even to amaurosis; the visual field, too, is affected frequently in the lower and inner quadrant, and also often concentrically, to a high degree. Colour vision is remarkably well preserved; light perception slightly reduced. Detachment of the retina is of frequent occurrence, and is one of the ultimate causes of final amaurosis. There is hardly any doubt that it is caused principally by the enormous stretching of the eyeball. Graefe already pointed out that under the influence of the stretching, the retina finally takes up the position of a chord, *i.e.*, becomes detached from the choroid and slackens.

The detachment of the retina is often facilitated by the extensive liquefaction of the vitreous, which occurs as frequently in the later stages of hydrophthalmus as of myopia. Detachment of the vitreous itself has not been observed. What has been described as such has now been found to be nothing else than an artificial shrinking of the vitreous due to the hardening fluids used for pathological examination.

Of his 47 cases Seefelder found the retina detached in 10, but of the latter number 6 have to be considered as due directly, or indirectly, to operative interference in the course of treatment. The author considers the decrease of the intraocular pressure as the essential criterion of the detachment of the retina in the hydrophthalmic eye, when ophthalmoscopic examination has become impossible. A yellow reflex behind the lens may or may not be present, and this may be due to other causes. But even the reduced intraocular pressure is no infallible guide, and even it may be increased again by such further occurrences as intraocular hæmorrhages, iridocyclitis with secondary glaucoma, etc.

Pathogenetically, neither heredity nor consanguinity can be considered to have any great influence. Concomitant congenital malformations of the eye or of other parts of the body have been observed without throwing any further light on their simultaneous occurrence.

With regard to hereditary syphilis, an influence can only be traced in a small proportion of cases. In a large number of those cases of which an accurate history could be taken, it was found that the patients came from families subject to

diseases of all kinds and with an unusually high mortality. The most prominent of these diseases was rachitis. On the other hand, an "indefinite congenital trophoneurotic" process with well-defined symptoms, viz., goitre, predisposition to melancholy, tachycardia, cardiac spasms, as described by Angelucci, could not be corroborated.

The treatment of hydrophthalmos is, on the whole, not always very successful. So many failures have resulted from different operative interferences that many authors have ultimately abandoned surgical treatment altogether and confined themselves to medical treatment only.

Iridectomy has been the favourite operation, but even its most ardent advocates have had occasion to warn against its employment in the later stages. The dangers connected with and following its use have led to the introduction of other operations for which less dangerous consequences were claimed. First of all there is sclerotomy, for which great success has been claimed, first by Mauthner, twenty-five years ago, and again lately by Haab. Then the incision through the angle of the anterior chamber, as recommended by de Vincentiis, with equally doubtful results; resection of the sympathetic nerve has apparently been without any beneficial result. Paracentesis of the anterior chamber has shown good results in a few cases. Cyclodialysis has been proposed by Heine; though easy to perform and not dangerous, it has shown itself ineffectual in the author's hands.

After reviewing these various methods of operative treatment, the author comes to the conclusion that the principal point in the treatment of hydrophthalmos is to operate *as early as possible*, before an excessive distension of the membranes of the eyeball and of its contents has occurred, and before liquefaction of the vitreous and changes in the retinal vessels have taken place. As for the actual operation concerned, only iridectomy and paracentesis of the anterior chamber are recommended.

Finally, the treatment of cataract in hydrophthalmos is mentioned briefly, and its removal by primary linear extraction recommended in preference to the far more dangerous and less effective discission (needling).—A detailed description of the author's 47 cases forms the end of the clinical part of the paper.

K. G.

CLINICAL NOTES.

HEREDITARY INFLUENCE IN LAMELLAR CATARACT.—In a few cases the occurrence of lamellar cataract in the new-born has been established by competent observers. Hosch relates an instance of its occurrence in three generations; in the third generation three out of ten children being affected. Also another instance of a mother and two children being alike affected. There was a clear history of a white spot having been observed in the pupils after the birth of each child. Both were entirely free from rickets.—*Archiv für Augenheilkunde*, February, 1906.

EARNING CAPACITY AFTER INJURIES TO THE EYEBALL.—Among several thousand workers in various workshops, Feilchenfeld found 81 with one eye defective either through accident, disease, or refractive error. In only eight cases was the earning capacity of the man reduced below what it had been or would have been had the subject enjoyed full binocular vision. The economic effect of an injury to one eye depends on the circumstances of each particular case; but by far the most important factor in assessing compensation must always be that when one eye is incapacitated from any cause it will make all the difference to a man whether or not he has a useful second one.—*Zeitschrift für Augenheilkunde*, February, 1906.

AN OPERATION FOR RELIEF OF ECTROPION.—Jocqs exhibited at a recent meeting of the Ophthalmological Society of Paris a patient whom he had cured of an enormous ectropion of one lower lid by an unusual method of operation. He drew three lines of cauterisation from cul-de-sac to free margin of the lid, as narrow as possible, but at the same time quite deep. He then placed the lid in position and temporarily united the upper lid and the lower; by acting thus he avoided requiring to use a bandage which by its pressure would have acted in the

opposite direction to the cicatrisation desired. When cauterising, in order to avoid the mistake of interfering in any way with the bulbar conjunctiva, the surgeon must beware of drawing upon the lid before operating. It is, however, necessary to make the line of cauterisation run quite from the cul-de-sac. The same method is, he says, very useful in those slight degrees of ectropion just at the inner canthus which are so frequently the cause of lachrymation in old people; in such a condition naturally one touch of the cautery suffices, which should cease just inferior to the canaliculus. This method of operating has given Jocqs rapid, certain and gratifying results. —*La Clinique Ophthalmologique*, xii., 6.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

June 14th, 1906.

The President, Mr. PRIESTLEY SMITH, in the chair.

CARD SPECIMENS.

Lymphatic Obstruction causing Edema of Lids.—Mr. A. McNab.

This was the case of a patient who had suffered from swelling of the lids for 4 years, beginning on the left side; and the right eye became affected 2 years later. Three months ago an attack of blepharoconjunctivitis aggravated the condition, causing dilatation of the lymphatic vessels on the ocular conjunctiva. Medicinal treatment in the form of arsenic and thyroid extract had been tried in the hope of reducing the œdema.

A case of Rosea of the Cornea.—Mr. Sydney Stephenson.

This was the case of a woman who was the subject of a small, raised, vascularized patch on the limbus of the right cornea. It had the appearance of an ordinary phlyctenule, but the presence of acne rosacea on the face, together with the chronic nature of the affection, led Mr. Stephenson to regard it as a case of rosea of the cornea.

Cupping (? Congenital) of the Optic Disc associated with Capsulo-pupillary Membranes.—Mr. A. Hugh Thompson.

A.B., aged 25, a domestic servant, had noticed defective sight in her left eye on June 1st, which had come on suddenly while she was sweeping a room. On examination both eyes were found to show remains of the capsulo-pupillary membrane.

R.V. : C—1 = $\frac{6}{12}$ (2 letters). L.V. : Counting fingers. The right fundus was normal; but the left disc was deeply cupped, and the upper half of the visual field was absent. The rest of the fundus was healthy, there was no detachment, no vascular change, no pain, and the tension was normal.

Occlusion of the Levator Palpebrae on attempting to look down and in, with a partially paralyzed Inferior Rectus.—Mr. A. Hugh Thompson.

J.B., aged 45, had a fit three years ago, and another 18 months ago. Since the fits he complained of headache and diplopia, and some facial paralysis was found to be present.

On examining the eyes, the right eye was normal in every respect, and the movements perfect in all directions. In the left eye the vision was $\frac{6}{6}$, with a cylinder of +1, with its axis 80° down and out; the lateral movements were very defective, producing crossed diplopia. The left palpebral aperture was larger than the right, and increased in size on looking downwards, when excessive action of the levator palpebrae took place. The left pupil acted to accommodation, but not to light; the knee-jerks were brisk.

Curious Corneal Condition.—Mr. R. E. Bickerton.

P., aged 35, male, had noticed defective sight in the left eye 5 years ago. He attended some years ago at the Birmingham Eye Hospital, but had lately been under the care of Mr. Treacher Collins at the Royal London Ophthalmic Hospital. Both eyes were somewhat buphthalmic, with deep anterior chamber; the vision of the right was $\frac{6}{18}$ and J1, that of the left with—4 sph = $\frac{6}{36}$ and J14. There was no pain, no iritis, and the fundus was normal in both. In each eye the cornea was large and showed several canal-like opacities running mainly in a direction downwards and inwards, and in many cases extending right across the cornea from one side to the other; some smaller curved linear opacities joined these at right angles. The middle layers of the cornea were slightly infiltrated, and there were many fine dotted opacities.

Cavernous Angioma of the Orbit of nearly 30 years' duration; Evisceration of the Orbital Contents.—Mr. T. Holmes-Spicer.

Michael D., aged 47, was first seen at the Royal London Ophthalmic Hospital in January, 1884, by Mr. Nettleship, and the case was

described by him in the *T.O.S.*, vol. iv., p. 47, under the heading of "Nævus, ? lymphatic, affecting the brow, orbit, and exterior of the eyeball, with lamellar cataract. No cataract in other eye."

He attended the Hospital several times, and in 1885 a fold of conjunctiva was excised; in 1897 the lids were stitched together to save the cornea. He was then lost sight of until March 19th, 1906, when he came again under observation. At this time there was extreme proptosis with displacement of the globe upwards by solid growth, which surrounded the eyeball on all sides. The tumour was freely movable, and felt like a collection of enlarged thickened veins, with several definite areas of hardness in them. The lower conjunctiva was red and velvety; there was some limitation of movement, but no pulsation could be felt anywhere, and there were no enlarged glands; the cornea was exposed and ulcerated below, the anterior chamber was good, the iris acted well, the lens was opaque, but some visual perception remained at the temporal side. The vision in the other eye was $\frac{6}{6}$.

On March 30th, 1906, the orbital contents were eviscerated by separating the periosteum all round the inner wall of the orbit, and dividing the pedicle at the apex of the cavity behind; there was considerable hæmorrhage which was, however, easily controlled by pressure and subsequent packing. The bony wall was found complete posteriorly.

Pathological Report.—Mr. Coats.

The tumour was found to be a typical cavernous nævus, with thickened trabeculæ situated in the cone of muscles; the bulbar conjunctiva from the limbus to the fornix was thrown into folds; all the intraocular structures were normal.

The microscopical examination confirmed the innocent nature of the tumour, merely showing a small amount of round-cell infiltration in the trabeculæ, and a few pigment cells, but there was no pigment proliferation, and the choroid was unaffected; a few blood spaces were seen in the posterior layers of the sclera, and some of the spaces formed by the interlacing trabeculæ were filled up with proliferated endothelial cells. The folded conjunctiva consisted only of hypertrophy and œdema, no cavernous structure being evident; and the lens showed typical lamellar cataract. The dural sheath of the optic nerve was thickened but caused no compression.

PAPERS.

A Short Note on Steels which are not Magnetic.—Mr. Simeon Snell.

Mr. Snell in this paper drew attention to the fact that the increasing industrial use of alloys of steel had resulted in the manufacture of many

varieties, on some of which the effect of magnetism is much lessened or indeed totally abolished.

He described some of the principal forms of steel which were made, and illustrated the strength of their magnetic attraction by practical experiment. He mentioned that there were three main varieties of steel alloys, viz. : the hard, medium, and soft, the hard being the purest and consisting of 1 to 1·5 per cent. of carbon. The chief point of interest attached to the manganese alloy. It is generally believed that when the percentage of manganese is above 2·75 per cent., steel becomes brittle, but it has been recently discovered that when the percentage reaches 7 per cent., and from this point up to 20 per cent., a new metal is produced which is remarkable for its strength and toughness; its susceptibility to magnetism, however, diminishes in inverse proportion, so that after the manganese reaches about 12 per cent. it is almost entirely non-magnetic.

Other alloys were mentioned, such as that of iron and chromium, and iron and nickel, the latter being extremely magnetic, though it can be rendered non-magnetic by the addition of a very small percentage of carbon and manganese.

Mr. Snell remarked that fortunately it was still true that the vast bulk of all steel splinters penetrating an eyeball came from steel which was magnetic, but the increasing possibility of the foreign body being of a non-magnetic character, especially in large iron and steel industrial centres, should not be lost sight of.

A peculiar case of Hereditary Congenital Cataract.—Messrs. E. Nettleship and F. Menteith Ogilvie.

Mr. Nettleship showed diagrams and drawings of a family in which about 20 persons extending over 4 generations were the subjects of a peculiar form of partial congenital stationary cataract. The opacity, which was circular, well defined, and very finely granular, was situated between the nucleus and the posterior pole, and measured 4 mm. in diameter.

About 150 cases in all were systematically examined by Mr. Menteith Ogilvie. Some of the cases had been seen many years ago by Mr. Doyne at the Oxford Eye Hospital, and have been recently re-examined by Mr. Ogilvie and found to be unaltered. The condition causes but little loss of visual acuity and only a slight desire to shade the eyes in a brilliant light. One group of the same family living in Edinburgh was examined by Mr. George Mackay. All the cases occurred in one branch of the family tree.

An unusual case of Tuberculosis of the Choroid involving the Optic Nerve.—Messrs. L. V. Cargill and M. S. Mayou.

Mr. Cargill reported in this paper the case of a man, aged 21, single, who was admitted on December 18th, 1905, in King's College Hospital, under the care of Dr. Norman Dalton. He had been well six weeks ago, and one month before admission he was ill in bed suffering from what was thought at first to be influenza. His symptoms suggested typhoid fever or tuberculosis, but no physical signs were present, and all examinations of the blood proved of a negative character. During his stay in the Hospital he continued to have irregular pyrexia, the temperature varying between 98—99 and 102—3. Examination of the eyes made on December 18th showed in the right eye an irregular-shaped yellowish patch about one disc and a half diameter below the papilla, shading off gradually into the surrounding fundus, and placed with its long axis transversely. There was no pigmentation, barely $\frac{1}{2}$ D of swelling, and beyond a relative scotoma for white in the area corresponding to the patch, the rest of the fundus and field was normal. In the left eye there was some swelling and œdema at the outer and upper margin of the disc, completely obscuring the edge, and extending out into the fundus, and the papilla showed 1D of swelling. A few days later the whole of the margin of the disc was entirely blurred, and hæmorrhages appeared in several situations, while the general œdema had extended outwards towards the macula. Over this area there was a white, irregular patch with one or two stellate hæmorrhages above it, and the papilla now was swollen to the extent of 2 or 3 D. On January 8th the œdema had increased, and by January 25th another circular, greyish patch had developed beneath a branch of the ascending temporal artery above the left macula. On January 27th R.V. = $\frac{6}{5}$, L.V. $\frac{6}{12}$ pt.

A week later a similar patch had appeared in the upper part of right fundus. It was not until the latter part of December that physical signs were discovered in the lungs, and on February 17th tubercle bacilli were first found in the sputum. Three days later the patient died. Mr. Cargill dwelt upon the possibility of establishing the diagnosis in doubtful cases by reference to the ophthalmoscopic appearance, though it is not the general opinion that any positive statement can be made from this alone.

The pathological examination was made by Mr. Mayou, who found that a large swelling existed close to the globe limited to the outer side of the nerve sheath. In the region of the optic disc there was a prominent, yellowish swelling, from which the retinal vessels emerged laterally, and which tapered off into the surrounding retina, no definite edge

being distinguishable. The microscopical examination proved this latter swelling to be a typical tuberculous mass consisting of giant cells, epithelioid cells, and lymphocytes, with well-marked caseation in the centre: choroidal pigment was scattered through the deeper layers, but there was no pigment proliferation. The swelling on the nerve outside the globe was due to distension of the sheath, with non-albuminous fluid caused by the pressure of the tuberculous mass which also was responsible for the œdema of the disc.

The most satisfactory explanation of these deposits of tubercle in this situation seems to be that the original infection is carried by the blood stream to one of the minute vessels making up the anastomosis of the circle of Zinn.

MALCOLM L. HEPBURN.

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REGISTRATION OF OPTICIANS.

By FREELAND FERGUS.

THE proposed legislation for the registration of opticians, if adopted, may make a considerable alteration in certain departments of ophthalmic practice as carried on to-day. It is to be hoped that Parliament, in the interests of the public, will strenuously set itself against any attempt to allow a person to practice an important branch of the medical craft on what may be called a bogus qualification. There is only one way in which a man can acquire sufficient knowledge to practice ophthalmology for the best advantage of the public, and that is by years of patient study; no one is competent for ophthalmic work who has not had a very extensive training in the profession of medicine generally. One indirect public advantage which registration would give is that it would prevent spectacle vendors who are wholly incompetent from advertising themselves as being fit craftsmen. Just the other day I came upon a patient who was wearing a spherical +4 D. glass and who had a myopia of 10 dioptries, yet these very glasses had been prescribed by an optician who has not even got any of the *quasi* diplomas, but who, notwithstanding, advertises himself extensively as an ophthalmic optician with a special knowledge of eye testing.

If a Bill passed by Parliament could put an end to this sort of thing it would not be without some benefit, but we question very much if any such legislation will be put on the statute book. However desirable it may be to prevent ignorant and incompetent persons from prescribing for so delicate an organ as the eye, still, on the other hand, the legislature is not likely to pass an Act which will prevent any man from selling a pair of spectacles.

The attitude which Ophthalmic Surgeons have taken up in opposing the proposed legislation is thoroughly proper. No man by a few months attendance at a course of instruction on very elementary optics can have a sufficient knowledge to treat ocular conditions with any degree of thoroughness, and surgeons naturally have a fear that should the Bill become law it would legalize a form of quackery which, as the instance just quoted above shows, is already rampant enough in our midst. Were the Bill to produce a set of men who would stand to the ophthalmic surgeon very much in the same relationship as the pharmaceutical chemist stands to the physician, then probably it would be beneficial, for it would mark out the men who had had a sufficient training to carry out instructions in a reliable manner from those who are without any such knowledge. We question very much if this aspect of the case will find acceptance with legislators. The law, for obvious reasons, makes it impossible for a man who has not had a special training, and obtained a certificate, to dispense to the public various strong poisons. The danger of an unqualified person undertaking such work is very great, but the danger of a wrong pair of spectacles being prescribed is not one which is likely to appeal to Members of Parliament as requiring legal interference.

In view of the controversy which is at present going on, and which is likely to become more acute, it is to be regretted that there is no British diploma or degree giving to its holder a qualification in ophthalmic medicine and surgery. The ophthalmic surgeon may well say to the spectacle vendor that he is not qualified, but at present it is equally open to the spectacle vendor to say, "No more are you, in so far as you have got no special diploma of competency in ophthalmic work."

We do not wish to be misunderstood on the point. The present system has produced men in the department of ophthalmology of first-rate standing. We hope that in the main they are quite equal to any to be found in other branches of special practice. We venture to think, however, that ophthalmology is now the most advanced of all the specialties, and just as a register, separate from the General Medical Register, is kept for dentists who have taken out certain courses of instruction and passed examinations, so we think there should be a special diploma and register for fully trained ophthalmic surgeons.

Ophthalmology cannot now be regarded merely as a branch of Surgery. A great deal of it no doubt involves a thorough knowledge of surgical handicraft, and above all of the most recent surgical pathology, but in other phases, ophthalmic work is much more closely connected with the physical sciences, and our experience shows that it is just in this direction that, in a few instances, the present system has failed.

Some years ago we called attention to this subject in a paper in the *British Medical Journal*,* in which we attempted to sketch a course of instruction for those intended for ophthalmic work.

In that article we pointed out the difference which we thought should be made between the present curriculum of the ordinary medical student and that of the man intending to be an ophthalmic practitioner. Even in the preliminary examination a difference should be made. An ophthalmic student should certainly have a thorough knowledge of plane trigonometry, and also should have some

* "British Medical Journal," April 27th, 1901.

idea of the elements of the calculus. Were this required, we would hear less in ophthalmic text-books of distances being greater than infinity; nor would it be possible to find the well-known formula for the range of accommodation in emmetropia written:—

$$A = P - \infty = P$$

As regards strictly professional education, an extensive course of physics should be required, with probably two years of laboratory training. In the same manner, those parts of physiology which have special reference to vision should receive adequate attention. The training in medicine and surgery should be quite as extensive as for a student who intends to take up medical practice, and ample clinical work should be insisted on. I would exempt the ophthalmic student from studying insanity, but would see to it that he knew something of neurology. Pathology should receive a prominent place in an oculist's training. He should attend both a general and a special course, and should have an intimate acquaintance with the methods of bacteriological investigations. Unquestionably sound treatment depends upon sound pathological conceptions.

His ophthalmic studies should include instruction on (*a*) external diseases, (*b*) fundus conditions, (*c*) operative work, (*d*) errors of refraction, (*e*) muscular defects, (*f*) perimetric examinations.

It is sometimes anomalous that an ophthalmic practitioner should, in his student days, have been compelled to attend a course of instruction on midwifery and gynaecology, but at the same time be allowed to escape altogether without a laboratory training on the use of such instruments as the spectroscope, the spectrometer prisms, and the spherometer. It is also an anomaly that at present to become an ophthalmic surgeon, a man must have

attended a course of lectures on jurisprudence, but that it is not necessary for him to know anything of plane trigonometry; although it must be admitted that without such knowledge he is quite unable to read text-books which are indispensable for his work.

We do not for a moment suggest that any medical practitioner should be prevented from practising ophthalmology if he wishes; all we advocate is that a man who has a thorough training in elementary mathematics, in the work of a physical laboratory, and in certain special branches of surgical pathology, should be entitled to have his name put upon a separate register. Were such an arrangement carried out we feel that it would enormously strengthen the position of ophthalmic surgeons in opposing the proposed legislation.

REVIEWS.

Parinaud's Conjunctivitis.

- (a) K. Hoor (Kolozsvar). *Klinische Monatsblätter für Augenheilkunde*, April-May, 1906.
- (b) St. Bernheimer (Innsbruck). "A contribution to Parinaud's Conjunctivitis." *Klinische Monatsblätter für Augenheilkunde*, April-May, 1906.
- (c) W. Reis (Zemberg). "On Parinaud's Conjunctivitis, with a Contribution to the Question of the Plasma-cells." *Archiv für Ophthalmologie*, lxiii., 1.
- (d) F. H. Verhœff and G. S. Derby (Boston, U.S.A.). "The Pathological Histology of Parinaud's Conjunctivitis." *Klinische Monatsblätter für Augenheilkunde*, June, 1905.
- (e) W. Goldzieher (Budapest). "On Lymphoma-Conjunctivitis ('Conjunctivite infectieuse de Parinaud')." *Centralblatt für praktische Augenheilkunde*, January, 1905.

THE above are the most important of the recent papers concerning the disease described in 1889 by the well-known

surgeon. Parinaud, who died in March of last year. They indicate that the affection is not so rare as the earlier observers believed, and also that a knowledge of the condition has spread to most clinics. The other papers will be taken up in association with Professor Hoor's (*a*) article, which contains an exhaustive review of the whole subject. He opens with a detailed review of all cases reported up to August of last year; these making, with his own case, a total of forty-four. To these may be added the cases of Bernheimer (*b*), Reis (*c*), Scholtz,¹ Villeneuve,² Caspar,³ and Griffin.⁴

Professor Hoor's patient was a boy of eleven years of age, a cowherd for three years, who had ptosis and swelling of the left eyelids, with numerous granulations on the conjunctiva and a very slight muco-purulent discharge. The left pre-auricular gland was enlarged and the cervical glands suppurated, but no organisms were found in the pus. There was slight general disturbance. Seven months later, after partial excisions, the condition had completely disappeared. The granulations upon microscopical examination resembled fibroid tubercles with typical giant cells, epithelial cells, and round cells surrounded by fibroid capsules. Repeated examination for tubercle bacilli, and inoculations of the inferior chamber of a rabbit, and of the subcutaneous tissue of one guinea-pig, and the peritoneum of another, were negative.

Professor Bernheimer's patient (*b*) was an hotel-keeper, of fifty-two, who had all the above symptoms on his left side, but the conjunctival discharge was frankly purulent, and there were two small marginal crescentic ulcers of the cornea. The latter rapidly healed under simple treatment, but the granulations and growths increased so much that the author excised the whole of the upper tarsus with the adherent conjunctiva. Thereafter the condition returned to normal, and the patient was dismissed from hospital five months after admission. The microscopical result was very similar to that found by Verhœff and Derby (see later), and proved that the tarsus was absolutely unaffected by the diseased process. The absence of organisms and the negative result of inoculations for tubercle bacilli are noted.

Reis (*c*) reports the case of a girl of fourteen, who aided in milking the cows at a certain place. Her symptoms were exactly the same as those in the first case, and the patient was treated by partial excision of the granulations, and of the

suppurating glands. There was complete recovery and she was dismissed after two months in hospital. No organisms were found in the pus, and inoculations in guinea-pigs were likewise negative.

He also describes a case of a girl of fifteen, who had phlyctenular conjunctivitis with pannus and corneal infiltrations. There was growing from the centre of the upper fornix a button-like growth with a narrow pedicle. The diameter of the flattened portion was 5 m.m. The conjunctiva was slightly roughened. After removal the wound healed and left no scar. The author found a considerable variety of plasma-cells and of other granulation tissue elements. The case was evidently a simple granuloma, which was probably the result of chronic irritation.

Verhoeff and Derby's patient (*d*) was a girl of twelve, whose father kept a horse, and the child often went into the stable and fed it. The case was a typical one, and recovery took place in less than two months.

Professor Goldzieher (*e*) describes a similar case in a girl of ten years, and refers to three cases he had published as lymphoma of the conjunctiva.⁵ "These four typical cases ran a violent inflammatory course," and gave "at first the appearance of acute trachoma." The author then recapitulates a case which he had described as lymphadenitis conjunctivæ⁶ in 1882, and claims it as the first described case of this disease. There were "no real irritation appearances on the part of the conjunctiva." The patient was a boy, fourteen years of age. The right lids were swollen, and attached to the upper fornix was a tumour of the size of a small hazel-nut. It was movable and not connected with the sclerotic. The pre-auricular and the cervical glands were much swollen. After excision of the tumour, the glands disappeared during treatment with iron and arsenic internally, and iodoform ointment externally. Goldzieher expressly states that this case had no resemblance to trachoma, while his other cases, and, in fact, most cases of Parinaud's conjunctivitis, have great similarity with acute trachoma. Professor Hoor discusses this question of priority with care. He points out that the glands in Goldzieher's patient were still swollen a year afterwards, whereas in the typical cases they return rapidly to normal, with or without suppuration, after the recovery of the conjunctiva. He is of opinion that

the case, though closely related to Parinaud's conjunctivitis, is not identical with it. Verhoeff and Derby are of opinion that by using separate names for his three publications, Goldzeiher indicates that he has no clear comprehension of Parineaud's conjunctivitis, and that his 1882 case was a typical lymphoid hypertrophy, although the clinical appearance was not inconsistent with the former disease. In the absence of an ætiological classification we must adopt a pathological system, and Goldzieher, in his description of the pathology of his first case, states that it was composed of adenoid tissue with lymphocytes which at places formed follicles. Similarly, the reviewer saw a case of pale granulations in the conjunctiva of one eye with slight swelling of the glands in a girl of nine years, which the microscopical examination and the further course proved to be malignant, and led to the death of the child a year later.⁷ To Parinaud belongs the honour of describing the first cases, although it is also true that Goldzieher was not aware of these cases when he published his 1893 series.

SYMPTOMATOLOGY.

After quoting Parinaud's original description, Professor Hoor discourses the various symptoms in succession. There is almost always some general disturbance at the onset, if not as a prodromal stage. It may be simply loss of appetite and a feeling of discomfort, but often it is accompanied by shivering and a slight rise of the temperature, up to 101°F. or thereabouts. This occasionally continues in the evenings, giving rise to a suspicion of tuberculosis. It has been believed that one eye alone has been attacked, but two cases are reported in which both eyes were affected. In one of these cases one eye was almost well before the other became affected; while, in the second case, the first was at its height when the other eye commenced. There was a very doubtful case, in which both eyes were affected at the same time. The right eye has been often more affected than the left. Parinaud stated that the cornea was never affected; and this has been found to be true, except in two cases [one is St. Bernheimer's (*b*)], in which there were small marginal ulcers. These appear to belong to the category of catarrhal ulcers, because they healed when the muco-purulent discharge was suppressed, and recurred when

it returned. The above-mentioned very doubtful case had double pannus, but it is practically certain that it was not an instance of Parinaud's conjunctivitis. One of the most important, although negative, characteristics of this affection is the complete return to normal after the obstinate and protracted course. No cicatrices are left in the conjunctiva, no matter whether the granulations have been absorbed or excised. As such it presents a great distinction to both trachoma and tuberculosis. Parinaud stated that the duration was usually four or five months; but the average of the collected cases was three months. The shortest on record was three weeks, and the longest one year.

The essential sign of this affection is, however, the concurrence of conjunctival disease of the type to be described, and glandular swellings. The granulations in the conjunctiva resemble trachoma grains, although they may be larger. They are chiefly found on the tarsal conjunctiva and in the fornices; but they may be seen on the sclerotic portion or on the caruncle. They are semi-transparent at first, and more opaque later, and of a yellowish red or yellow colour. The smaller are the size of a pin's head and the larger reach 2.5 to 3 m.m. In addition, smaller yellow granulations or points are present, which Parinaud thought at first were tubercles, but are really small necrotic areas or abscesses. Verhoeff and Derby (*d*) believe they are pathognomonic of this affection, but as a matter of fact they occur in rather less than half of the cases. Erosion of the epithelium is usual in the furrows, while ulcers may be found in the summit of the granulations. The latter have been as large as papillæ and flattened like a cock's comb.

The eyelids are swollen and firm, and there is often slight ptosis. The scleral conjunctiva is injected and may be chemotic. The secretion is serous with a few pus flakes in it, coming apparently from abscesses between the granulations. A severe purulent discharge has not been observed.

The glandular swelling is always on the same side of the face, jaw or neck as the diseased eye; and, in the great majority of cases it appears a few days after the conjunctival onset, but never later than two weeks. It rarely precedes the granulations. In about a half of the recorded cases the glands suppurated. As a rule, the swelling in the neck is

such that the individual glands are not separately palpable. The disease may occur at almost any age and affects the two sexes equally.

PATHOLOGY.

Verhœff and Derby (*d*) found that the polypoid granulations were composed in two cases of a granulation-like tissue, which differed from granulation tissue by the absence of pus cells. It consisted of large numbers of large lymphoid and epitheloid cells with scattered plasma-cells. The epitheloid cells were phagocytes and were probably of endothelial origin. There was extensive cellular necrosis. The deeper tissue consisted almost entirely of plasma-cells, fibroblasts, eosinophiles, and mast-cells, with a very few lymphocytes. The epithelium was thinned and at places contained many goblet-cells. The authors conclude that the essential change was a conjunctival cellular necrosis, infiltrated with lymphoid and phagocytic cells; the deeper tissues showed a chronic inflammatory reaction leading to new connective tissue formation.

Reis (*c*) found that the epithelium was little affected; but that the granulations consisted of an infiltration with closely-set plasma-cells, which, however, did not form follicles. Numerous so-called atrophic plasma-cells were present. The largest plasma-cells were ranged along the deeper vessels, where they best received nutrition. Lymphocytes were absent, and transitional forms between these and the plasma-cells were not observed. On the other hand, he makes out that there were transitional forms between connective tissue cells and the plasma-cells. He holds that the epitheloid cells are descendants of the connective tissue cells and are connected with them and the plasma-cells. His article is partly devoted to the question of the origin of plasma-cells, and at the commencement he reviews the different papers which have appeared on this subject, making special mention of Major Herbert's⁸ work on trachoma and the plasma-cells. While stating that necrotic areas were absent, and that Verhœff and Derby (*d*) were wrong in laying so much stress on their occurrence, he believes that the plasma-cells pass into an atrophic form and are then removed in the circulation. This fact explains the absence of cicatricial tissue and the return of the conjunctiva to normal, and is the essential difference between Parinaud's conjunctivitis and trachoma, in which the plasma-cells are

again transformed into connective tissue cells—a process which always leads to the formation of new connective tissue.

Bernheimer (*b*) found the same changes as Verhoeff and Derby, there being not only necrotic cases, but also many atrophic cells. He particularly mentions that the tarsus was found to be completely normal in all sections, in spite of the long continuance of the disease, and that the endothelium of the vessels was swollen and occasionally obliterated the lumen.

Hoor (*a*), as already mentioned, found structures closely resembling fibroid tubercles, and accordingly his case might be regarded as a mild form of tuberculosis of the conjunctiva. The absence of tubercle bacilli, the negative result of the inoculations, the fact that sections from other parts of the granulations did not show such tubercles, but quite a different appearance and one somewhat similar to Verhoeff and Derby's cases, and, finally, the known fact that giant cells are frequently seen in granulation tissues, all lead to the conclusion that it was a genuine case of Parinaud's conjunctivitis.

Goldzieher (*e*) found mucoid degeneration of the epithelium, increase of the goblet cells, cystic spaces, a great increase of adenoid tissue in the subepithelial layers, partly a dense cellular infiltration and partly follicles with connective tissue capsules. The cells were larger than lymphocytes and there were also giant cells. He does not mention plasma-cells, but it is probable that his large mono-nuclear cells belonged to this class. Matys⁹ was the first to search for plasma-cells, and he found that the granulations consisted almost entirely of them with a few additional polynuclear leucocytes.

We may conclude that the epithelial changes, thickening, goblet cells, mucoid degeneration, and infiltrating processes are all secondary and have nothing to do with the real nature of Parinaud's conjunctivitis. They are, in fact, related to the long continuance of the condition or the greater purulent secretion in some cases. The essential process appears to be the chronic inflammatory reaction in the deeper layers of the subepithelial tissues as a response to some stimulus. As Reis (*c*) points out, chronic inflammation always leads to plasma-cell formation (whether these arise from the blood or the connective tissues it is not necessary to discuss), and giant cells, mast cells, etc., may also occur. The granulations are an expression of that formation. Subsequently the new-formed cells die off either singly or in appreciable areas, and

are taken up by phagocytic cells or directly into the blood vessels, at least they are removed and there is little of any new connective tissue formation, thus allowing a complete return to normal without scarring. The enlarged glands appear to be due to a new formation of adenoid tissue with small necrotic areas or abscesses scattered through it.

ETIOLOGY.

Parinaud originally stated that he believed this disease originated by infection from animals, since the inflammatory onset, with suppuration of the glands pointed to this view, and each of his patients was intimately working with animals. Goldzieher and other observers deny such a connection in their cases, and are inclined to leave the aetiology open. Hoor, after reviewing the cases, finds that 21 in 33, or 65 per cent., were intimately associated with animals or connected with butchers. Doyne thought the infection was from cats or dogs. Nearly all observers have been at great pains to exclude tuberculosis and acquired or congenital syphilis from the diagnosis, clinically and from an examination of family relationships; and, in the former case, by bacteriological methods. One or two have found staphylococci and streptococci in the conjunctival secretion and the pus from the glands, but in most cases both have been sterile. Stirling and McCrae (this *Review*) found a somewhat virulent form of the *B. necrosis* in the conjunctival secretion, but the fact that it was not found in the pus from the suppurating glands shows that it was not related to the disease. Scholtz¹ has recently described an unnamed bacillus belonging to the Pest Bacillus group, but gives no relationships to the tissue changes. That no observer has ever seen two cases in the same family or neighbourhood, and the negative result of attempts to produce the disease in the patient's healthy eye by the discharge from the diseased eye, are facts which negative the idea of contagion, although they do not disprove the possibility of an external infection being the cause of this curious disease. We do not know the stimulus which calls forth the new formations and subsequently leads to their necrosis or atrophy. It must be a toxin, bacteriological or otherwise.

DIFFERENTIAL DIAGNOSIS.

Trachoma is excluded by the prodromal symptoms, the occurrence of swollen glands, the absence of pannus,

and the complete *restitutio ad integrum*. Tuberculosis is excluded by the microscopical examination and, if necessary, by experimental inoculation. Lymphoid hypertrophy of the conjunctiva, which affects both eyes, is likewise excluded by the microscopical examination. The very rare granular syphilis of the conjunctiva is always accompanied by inflammation of the anterior uveal tract and of the cornea, and the glands become firm, and slightly enlarged, and usually the glands of the rest of the body are involved. Spring catarrh has a different situation and character, and the glands are not swollen. The same applies to the common follicular conjunctivitis. The *prognosis* is always favourable.

TREATMENT.

This has been much discussed. Some hold that an expectant treatment is sufficient, while others urge the most energetic measures possible. A simple antiseptic lotion, iodoform, silver nitrate and its substitutes, are general favourites. Excision appears to hasten the progress. The cautery and sharp spoon seem barely necessary. Removal of enlarged glands is advantageous.

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C. N. SPRATT (Minneapolis, U.S.A.). **A Case of Parinaud's Conjunctivitis.** *Archives of Ophthalmology*, 1906, ii.-iii.

SPRATT publishes a case of what he diagnosed as Parinaud's conjunctivitis, in which there were presented also some other symptoms which are certainly unusual.

The patient was a woman, aged 30, a housewife, who first consulted him eleven days after the onset of the disease. On a certain day she found on awaking that the lids of the right

eye were swollen and that it was only with difficulty that she could open the eye. On the same day swelling and tenderness in front of the right ear were also noticed. For some days she felt out of sorts, with a certain amount of pain over the head; the eye itself was not really painful, though it was reddened and there was a slight watery discharge from it: there was no photophobia. She considered herself to have influenza, and remained in bed for a day. Gradually, however, the swelling of eye and face increased until mastication was painful and difficult.

Spratt found her to have marked ptosis: the skin of the lids was tense and smooth, but not red: there was no photophobia, but the conjunctiva of the globe was much injected and chemosed; the palpebral conjunctiva of both lids showed raised grey patches. On the globe, too, beneath the chemosed conjunctiva were numerous grey translucent masses from $\frac{1}{2}$ to 2 mm. in diameter. The cornea was not involved at all and vision was perfect. The submaxillary, parotid and preauricular glands were swollen and the skin over them tense though not reddened: the tonsils were injected, swollen and painful. Temperature stood at 100·2, and there was considerable malaise and depression.

A couple of days later the subconjunctival masses had become opaque and of a yellowish colour: Spratt excised one or two of them: the chemosis was hardly so marked. In a day or two longer erythema nodosum appeared, patches showing themselves over the left tibia and forearm, and the right patella, tibia, and calf; the spots were rounded, tender, movable over the deeper parts, and the skin bright red and tense. These did not remain long, and as they improved so did the throat. Gradually the little ulcerated areas of conjunctiva healed up, and the chemosis went down. The masses under the conjunctiva remained yellowish, but showed no indication of breaking down, though the submaxillary gland evidently began to contain pus, which had to be let out: this was thin and yellowish.

Microscopic examination of the tissue excised showed tissue densely infiltrated with small round cells, plasma cells, and large phagocytic epithelioid cells containing detritus and necrotic nuclei. Certain areas took on the eosin stain very deeply, and in them the cells were evidently necrotic and the nuclei showed marked fragmentation, and numerous strands

of film were present there also. In sections cut from one of the excised pieces of tissue at least there were very few leucocytes indeed, but in those which included a necrotic area they were in great abundance: this was probably an older patch which had become eroded or ulcerated. Pus from the pre-auricular gland showed staphylococci.

Spratt then proceeds to discuss previously recorded cases, but as we publish in this number Dr. Buchanan's review of the recent literature of the subject, we need not follow Spratt: he does not mention whether his patient kept any pet animals or had anything to do with butchers or with horses.

W. G. S.

JEAN GALEZOWSKI and A. LOBEL (Paris). **Tabetic Optic Atrophy and Central Scotoma.** *Recueil d'Ophthalmologie*, April, 1906.

THE classical alteration of the visual field found in *tabes dorsalis* is a gradual and increasing circumscription of the periphery of the field. A diminution of vision in the central region, producing central scotoma, is less common. Von Grosz, in 101 cases, found no central defect. Panas quotes 4 cases, 1 only of which came under his personal observation. Schmidt-Rimpler believed that when such a scotoma was found it was due to the complication of tobacco or alcoholic poisoning, or to a syphilitic retro-bulbar neuritis. Uhthoff believes central defect to occur in 2 per cent. of tabetic atrophies. Galezowski found 5 cases amongst 114 patients, a proportion of 4.3 per cent.

The writers discuss the bearing of the anatomy of the optic nerve on the selection displayed by certain disease processes in producing peripheral and central changes in the nerve; and the ophthalmoscopic changes in the nerve head coincident with them.

The loss of peripheral vision, so characteristic of *tabes*, is in agreement with the whitening of the upper, inner, and lower quadrants of the nerve head during life, and the peripheral sclerosis of the nerve as seen in sections *post-mortem*.

Two rival theories have been put forward to account for the pathological process producing these changes. That of Vulpian, Charcot, Virchow, etc., is that the tabetic atrophy

commences in the nerve itself. The other of Papoff, Moxter, and particularly of v. Grosz, is that the lesion commences in the ganglion cells of the retina and spreads along the nerve by degrees.

Recently, Pierre Marie and André Leri have made most elaborate observations on 11 cases of tabes, and also demonstrated that ganglion cells were always present at the peripheral parts of the retina, though the fibres at the periphery of the nerve were greatly diminished or even completely lost. They found two stages of the change in the nerve, an earlier irritation marked by the presence of an extensive new growth of vascular connective tissue; followed by later degenerative changes in the vessels, causing their gradual obliteration, and a fibrosis and disappearance of the nerve fibres. They showed that the original growth of granulation tissue came from the rich vascular network about the nerve which is an extension of the pia mater. The original seat of the process is in this vascular network. All these symptoms and pathological changes are in direct contrast to the condition known as retrobulbar neuritis of toxic origin in which the central region is peculiarly affected and the periphery rarely if ever.

The writers then detail 6 cases, in most of which the classical features of tabes were present, and in each case central scotomata. They are unable to believe that in these cases, all undoubtedly tabetic, the scotoma was the result of a mixed affection, a toxic amblyopia upon a tabetic amblyopia. They point out that it is quite consistent with the work of Marie and Leri that the papillary macular bundle should be affected by the tabetic change, for it is at one point of its course situated in the periphery of the trunk, immediately on entering the papilla. In these 6 cases of theirs the development of the blindness was very rapid, in contrast to the slowly developing amblyopia of retrobulbar neuritis. They believe that true tabetic central scotoma may be found in from 2 to 4 per cent. of cases.

The authors have shown undoubted acumen in bringing the results of the work of Marie and Leri to explain these aberrant cases of tabetic atrophy: perhaps they will some day demonstrate the actual lesion presenting its maximum development at the papilla and so complete their case. One would have thought that a marked growth of granulation

tissue so close to the nerve head would have been within the range of ophthalmoscopic examination. The cases are so difficult of explanation that even a brilliant speculation is welcome.

On one point the authors are unnecessarily dogmatic—they assert that the peripheral field is rarely if ever affected in toxic amblyopia; but it is possible, by a sufficiently delicate test, to demonstrate a circumscription of the field in almost all tobacco cases of any duration.

N. BISHOP HARMAN.

A. DARIER. **On the New Salts of Silver in Ocular Therapeutics.** Paris: Offices of La Clinique Ophthalmologique, 1906.

In this monograph the writer pleads for a more universal recognition of the advantages of the organic silver salts. He is so convinced of their superiority that he has discontinued the use of nitrate of silver for more than eight years. Nitrate of silver has a powerful bactericidal action which it owes to its base, silver, but it has at the same time a violent caustic action from the presence of nitric acid. The irritation and pain which result are not necessary for the therapeutic action of the silver salts. Of the numerous organic silver preparations introduced into therapeutics in recent years, two have been unanimously recognised as superior to all others, viz., protargol and argyrol. Both these salts penetrate deeply into the mucous membrane. Protargol is less caustic and less painful than nitrate of silver and may be applied more freely and more often. It contains only 8.3 per cent. of silver, while the nitrate contains 63.5 per cent. The solutions of the former require, therefore, to be made much stronger. Darier believes that in almost all cases nitrate of silver may be replaced, with advantage, by protargol. In purulent ophthalmia a 25 per cent. solution is applied to the everted lids, the eyelashes and the edges of the lids are rubbed energetically and rapidly with a brush soaked in protargol—this latter procedure is especially useful for cases of conjunctivitis accompanied by blepharitis—and a 5 per cent. solution should be used every half-hour. As a prophylactic, protargol compares well with nitrate of silver.

For trachoma especially, insufflations of powder of protargol are recommended.

Argyrol is the ideal silver salt. It contains 30 per cent. of metallic silver. It is painless when applied to the conjunctiva; even a 50 per cent. solution may be used to the eyes without any inconvenience. In simple catarrhal conjunctivitis, Darier uses a 5 per cent. solution in distilled water, four to six times daily. For purulent ophthalmia, the strength of the solution is increased two or four times, and it is used every hour or even every half-hour. In addition, the author himself applies a 25 per cent. solution once daily by separating the lids and placing several drops in the conjunctival sac to form a kind of eye bath; he then rubs the edges of the lids and the eyelashes with argyrol in the manner already indicated. As a prophylactic against purulent ophthalmia, 20 per cent. argyrol is employed. Argyrosis is liable to be produced both by protargol and argyrol. Darier relates also his experience with collargol, argentamine, and other new silver salts. Notwithstanding the eulogistic terms used in favour of the advantages of the newer silver salts, it should be noted that Darier does not counsel the abandonment of nitrate of silver which, he believes, has still its uses. In this work, the manner in which the different forms of conjunctivitis are treated is fully described and reference is made to results obtained by other observers with the new silver salts.

ANTONELLI. The so-called Rheumatic Affections of the Eye.
Archives d'Ophthalmologie, June, 1906.

WE are too lax, thinks Antonelli, in the application of the term "rheumatic" in various forms of disease of the eye, and the phrase is apt to be employed to cover over a very uncertain state of knowledge and a certain degree of lack of precision in one's critical faculty. Acute rheumatism we are familiar with, and its origin is probably sufficiently well recognised, but even if the actual morbid agent is uncertain, the whole facts point clearly to a condition of septicæmia, and its local results in the eye need not surprise us. Even for such conditions the author advises us to discard the word "rheumatic," and would rather say acute febrile arthritis, and

iritis (or neuritis) of infective, or metastatic, or toxæmic origin. Nor is the matter, in his opinion, merely a question of words, but one in which laxity in terminology indicates ignorance of nosology. As an example in point, he objects very emphatically to the employment of the phrase "gonorrhœal rheumatism"; one ought rather to call the affection "gonococcic arthritis," and to realise clearly that it is the presence of gonococci or of their toxins which lies at the root of the arthritis in such a case, and that this arthritis is not "rheumatism." He notes the fact that when metastatic gonorrhœal ophthalmia occurs the outbreak is almost always accompanied or preceded by arthritis—a fact which is probably due to the presence of the gonococcus or its toxins in the other parts implicated also.

In tuberculosis affecting the eye he sees an analogy with the arthropathy, and much valuable work has been accomplished in its investigation, but more yet remains to be done. Shall we be able, for example, by means of a cytological and biochemical examination of the aqueous humour, the lacrimal secretion, and that from the conjunctiva, to find some alterations which will enable us by means of laboratory experiments to make yet more precise classification and differentiation among cases?

He takes the group of chronic rheumatism and enquires as to the occurrence of eye disease in its sub-classes, as given by Professor Tessier: these are (1) polyarthritis deformans; (2) chronic rheumatism secondary to infections; and (3) toxic or diathetic rheumatism. In the first class it does not appear that the relation with such eye affections as occur in the course of the rheumatic condition is very close, in the way of cause and effect. In the late stages, when visceral complications have begun to occur, particularly degenerative nephritis, various parts of the eye may be attacked; but so far as Antonelli has observed the lesions there do not show any features other than do those of similar nature arising in cachexia from some other cause, or in some other toxæmic condition,—there is no essentially *rheumatic* character presented by them.

Rheumatic iritis is met with with considerable frequency, whether while the arthritic state is only in an initial stage, when the patient suffers merely from some pain in the limbs and joints, rendered worse by any sudden change in the tem-

perature, or in the stage of full development when the joints have already undergone permanent alteration. But in this instance also there is nothing definitely suggestive of rheumatism in the state of the eye; there is simply a plastic, adhesive iritis, or one in which the exudate is more serous, or a "quiet" iritis, in which the adhesions form almost without the knowledge of the patient that anything is going wrong. Since the precise form of the iritis is so uncertain, and since in a considerable proportion of cases of iritis, similar in character, no "rheumatism" or any cause whatever is to be discovered, as was the case after close investigation in 27 cases out of 131 which were carefully enquired into by Chevallereau and Chailous with the special purpose of discovering the etiology, can it be justifiable to be satisfied with the diagnosis of rheumatic iritis? How can we know that in the case of the iritis which occurs in the person of a rheumatic patient, "rheumatism" is the cause at all, and not that unknown element which is at work also in those other cases in which no "rheumatic" indications were present at all? He approves of the dictum of de Wecker that every case of iritis, of whatever type it may be, arises from some infection, though of this we frequently fail to discover the origin. Even when "cold" is the exciting cause (as it so often may be in the case, not merely of iritis, but of keratitis, scleritis, tenonitis, and optic neuritis in just such individuals), there must be some underlying, predisposing cause which Antonelli is not satisfied to call "rheumatism"—its etiology is still obscure.

Of the second variety of rheumatism he has not much to say: there is often a mixed condition. The patient not seldom has spondylosis, with a history of both syphilis and gonorrhœa in former days. To which of these intoxications is the iritis to be attributed? It is further to be remembered that in this form of "rheumatism" iritis or iridochoroiditis is far from rare, and in just those cases a history of tubercular affections or of repeated or protracted blennorrhagia is also not infrequently to be obtained: where the patient is young, the former is the more likely explanation; in the adult, the latter.

There remains for consideration the uric acid diathesis, the condition in which occur chronic joint affections of toxic or auto-toxic origin. In such patients the skin and mucous membranes are very liable to be affected, as is evidenced by the

occurrence among them of cases of obstinate squamous or eczematous blepharitis, chronic staphylococcus conjunctivitis with infarcts in the Meibomian ducts, hypertrophic rhinitis with a similar affection of the palpebral conjunctiva, etc. Further, as one might expect, these patients are also liable to visceral affections, especially gastric and intestinal, renal, biliary and bronchial,—all produced in the same way. And in them also the deeper affections of the eye are again far from rare, retinitis, retinal hæmorrhages, choroiditis, and even optic neuritis. When uric acid is present in the blood in excess it appears to have a special affinity for the white tissues, and thus the cellular tissue in the eyes is apt to become cedematous (the pseudo-cedematous type), there are apt to occur transitory, non-suppurative, orbital cellulitis (the pseudo-phlegmonous type), true scleritis, episcleritis fugax, and effusion into Tenon's capsule. In this connection, as having some relation to such conditions, Antonelli describes the curious case of a patient of his, a lady of 50, who during recurring attacks of uric acid of considerable severity suffered from a retraction of the eyes, especially the right eye, into the orbit,—a sort of paroxysmal enophthalmos. The only explanation he can give of such an occurrence, of which he has found no other example in the literature of the subject, is that possibly in the ligamentous and synovial tissue enveloping the cone of muscles which surrounds the optic nerve there have formed certain of those small nodes described by Stockman and others as being formed in similar tissue elsewhere: these have led to a spasmodic, cramp-like contraction of the muscles, attended with a good deal of pain, when lighted up by exposure to cold, errors in diet, or what not.

The conclusion of the whole matter, then, is that we should rather avoid the vague term "rheumatic" as applied to various eye diseases and try to discover the true cause in some more definite error,—uric acid or some auto-intoxication.

W. G. S.

ZUR NEDDEN (Bonn). **Certain of the Rarer Infectious Diseases of the Cornea.** *Klinische Monatsblätter für Augenheilkunde*, June, 1906.

ZUR NEDDEN adds yet another to the valuable papers which he has written on the infections of the cornea. He collects three sets of observations on the "rarer infections of the

cornea":—(I.) on the infectious marginal ulcer; (II.) on diplobacillary ulceration; and (III.) on influenza keratitis. To his own observations he adds a short review of the previously published information on these three subjects.

I. *The Infectious Marginal Ulcer.*

Zur Nedden emphasises the fundamental sub-division of corneal ulcers into those which are secondary to a conjunctivitis, and those which are not necessarily associated with any inflammation of the conjunctiva. The marginal situation of an ulcer, especially if it be a superficial one, is strongly in favour of a secondary infection: there is, however, a class of infectious ulcers, originally described by Zur Nedden, which he considers as primary. They commence by the superficial deposition of a fine infiltration about 1—1½ m.m. from the corneal margin, with which is associated a localized conjunctival injection. When the infiltrate breaks down a crescentic marginal ulcer results, and this spreads from its ends as well as by confluence of other ulcers formed in a like way. The author is of opinion that the pathogenic organism (the Zur Nedden bacillus) can remain in the conjunctival sac for some time without causing any inflammatory reaction, but in time may infect the cornea and produce the typical lesion.

In discussing the question of the cause of marginal ulcers in general, he states that he has very rarely been able to convince himself that any other organism can produce them, and in this he differs from almost all other observers, who have consistently found the Morax-Axenfeld bacillus in a fair proportion of such cases. This is remarkable, as diplobacillary conjunctivitis is very common in Bonn, and Zur Nedden has had a long experience in the bacteriological examination of corneal ulcers. It is unquestionable that many marginal ulcers are caused by the Zur Nedden bacillus, and that they can be identified often by their clinical features alone, and always by a bacteriological examination.

II. *Corneal Ulcers due to the Bacillus Duplex (type Liquefaciens of Petit).*

By contributing 4 cases to the literature the author brings the total number recorded to 13; other cases are those of Petit (3), Axenfeld (2), Macnab (2), and Paul (2). The four new cases are fully described, and the bacteriology of the

organism as found by Zur Nedden is given. With regard to the clinical history and also the bacteriology, the author agrees with the descriptions given by Macnab. "The characteristic of an *ulcus serpens*—superficially spreading in one direction with simultaneous clearing of the floor of the ulcer from the other side—was certainly not characteristic in a single case." The absence of pain, of photophobia, and of iritis, emphasized by Petit and denied by Macnab, were not constant features of these four cases, for all the patients had iritis and two had severe pain. Zur Nedden's view is that the Petit type and the Axenfeld type of the *bacillus duplex*, although related, are not identical.

The treatment by sulphate of zinc was satisfactory.

III. *Keratitis due to the Influenza bacillus.*

As all the other organisms which can cause an acute conjunctivitis may cause an ulceration of the cornea, it was only to be expected that the influenza bacillus could also. Zur Nedden publishes the first recorded case. In a patient with an acute mucopurulent conjunctivitis he observed a deep, round, central corneal ulcer with sharp margin and infiltrated floor, associated with iritis and hypopyon. From the ulcer and the conjunctival discharge enormous numbers of influenza bacilli were obtained. The treatment is not stated, but healing was complete in eight weeks. The case was one of those localized infections of the eye with influenza bacilli in which the respiratory tract was unaffected, and where general symptoms were not observed. As Zur Nedden has worked a great deal with this particular organism his pronouncement, "the organism proved on cultivation to be the true influenza bacillus," may be considered authentic.

The whole paper is a very valuable contribution to our knowledge of the bacteriology of corneal ulcers.

ANGUS MACNAB.

E. FRANKE (Hamburg). **Affections of the Corneal Epithelium.**
 "Über Erkrankungen des Epithels der Hornhaut."
Klinische Monatsblätter für Augenheilkunde, June, 1906.

In a paper recording much careful clinical examination and pathological research, Franke adds considerably to our

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knowledge of the changes which occur in the corneal epithelium after certain injuries. He devotes especial attention to recurrent corneal erosion, and his observations show that this condition is associated with a looseness (disjunction) of the epithelium, which occurs very soon after the original lesion, and may spread over the whole cornea except for a narrow margin at the limbus. In those cases where there are no obvious objective signs (*keratalgia recidiva traumatica*), this looseness can be demonstrated by passing a blunt probe over the cocainized cornea. Recurrence is not invariably the result of disjunction, as many injuries, *e.g.*, by foreign bodies, which produce disjunction, may not cause any recurrences of erosion. Franke attempted to reproduce the condition in rabbits, and only succeeded when some noxious substance—*e.g.*, the discharge from another rabbit's infected conjunctiva—was rubbed into the superficial wound: then there was a considerable detachment of the epithelium, which healed, leaving no obvious trace, but on cutting sections of the eye the same changes were observed as were found in pieces of detached epithelium from recurrent erosions in men. Franke examined pieces of detached epithelium from cases of recent superficial injury, recurrent erosion, and *keratalgia* without obvious defect, and found that the changes consisted in an oedema of the inter-cellular spaces and a necrosis of some of the cells, enlargement and rounding off of the cell protoplasm, the formation of vacuoles in the cells and bullous spaces between them. Similar appearances were found in dendritic ulcer, herpes corneæ, and filamentary keratitis. Franke considers that the changes do not affect the deepest layers of the epithelium, and that parenchymatous changes which sometimes occur are secondary, the separation of the epithelium is not due to an oedema of the parenchyma, as Peters holds, and that the changes can be attributed to some toxic material acting upon the epithelial cells. With regard to *treatment*, Franke points out that scraping off the affected (loosened) epithelium does (not) cause sound healing in most cases, but that if the denuded surface be painted over with aqua chlori, immediately washed away with saline solution, an excellent result is obtained in nearly every case. The reviewer is unable to understand why sodium chloride should be used to clear away traces of chlorine water, unless it be the readiest indifferent fluid to hand; but the aqua chlori has the ad-

vantage over the more usual carbolic acid in being less detrimental if unskilfully used.

The original article is well worthy of the careful attention of everyone interested in corneal lesions.

ANGUS MACNAB.

F. C. HOTZ (Chicago). **Amaurosis caused by Antipyrin.**
Archives of Ophthalmology, 1906, ii.-iii.

ONE knows that antipyrin is so frequently prescribed by physicians, and so very freely swallowed by the public even without the formality of a prescription, that a warning as to possible dangers from its use or overuse may not be amiss. There are, so far as is known, only three cases on record as yet of amaurosis caused by its use, so it cannot be in this particular direction a very dangerous drug: still it is well to be careful. In one of those cases a lady took 15 grains of antipyrin: in five minutes she became ill with palpitation of the heart, and completely blind: this amaurosis lasted three days, but fortunately she then entirely recovered. In the second case, a lady took the same dose and in three minutes began to suffer from headache, tinnitus, vertigo, palpitation, dyspnoea and cold perspiration. In twenty minutes she became blind, but fortunately also in her case vision returned, this time in about half-an-hour. In the third case, a man, who, at one-hour intervals, had taken three tabloids of 10 grains in each, had an attack of migraine, to which he was subject. It is not stated how long the amblyopia, which then came on, lasted. It is quite possible that at least in the first two of these cases there was some idiosyncrasy.

Hotz's case was that of a man of 33, a lifelong sufferer from migraine, like his mother before him. The only points of note in his history were that he had passed through enteric fever ten years previously, and that for the last three years he had suffered from occasional attacks which were considered to be "rheumatic." In these a number of very painful red spots appeared on limbs and trunk. Antipyretics caused these to disappear always; but, so far as he could say, there was no fever along with them. For the last two weeks he had complained of severe neuralgic pains in the right side of the head and in both eyes. Though movements of the eyes caused pretty sharp pain, vision was not interfered with, and he

continued to perform his clerical work without difficulty. The pain then went to the other side of his head, and refused to yield to quinine and salicylic acid, of each of which he took 4gr. every four hours for three days. He was then given antipyrin in 5 grain capsules; of these, within forty-eight hours, he swallowed twenty-six! During this period he noticed that his sight was failing, and, indeed, by the end of the forty-eight hours it was quite gone. He had been a "heavy" pipe-smoker; but Hotz does not say what amount of tobacco that represents or what variety the patient employed. When Hotz saw him central vision was abolished, but peripherally the man could count figures. The pupils at this time were widely dilated and immobile to light; tension was normal, the media were clear, the temporal half of the disc was very pale, and the vessels narrow; there was some peripheral reduction of the field. However, under iron internally with pilocarpin subcutaneously, &c., vision soon began to improve, finally rising to $\frac{6}{5}$ and $\frac{6}{6}$ in right and left eyes. The fields also became normal, and the small central scotoma which had been present in the left eye cleared up.

The question, of course, must crop up in such a case as this, where another drug (quinine) had been used and the patient was a heavy smoker—Is this a case of poisoning by antipyrin, by quinine, or by tobacco? Inasmuch as in tobacco amblyopia there is no restriction of the field, while in this case there was; and in quinine poisoning there is great restriction of the field which here was but little affected, Hotz decides against these two toxic substances and finds antipyrin "guilty" of causing the blindness.

W. G. S.

HARBRIDGE (Philadelphia). **Spasm of the Central Retinal Artery.** *Ophthalmology*, July, 1906.

In a recent number of this *Review*, Lundie published a case of great clinical interest and pathological significance, in which he was able to watch the condition of the retinal vessels during and after a spasm of part of the walls.

Harbridge gives a report of a case not altogether dissimilar. It is that of a man, aged 49, who, during the twenty-four hours preceding his consultation, had had attacks of absolute

blindness in the left eye: these had lasted a period of time varying from one to five minutes, and had occurred approximately every two hours; later, they had become even more frequent. The first indication of an attack coming on was a slight supraorbital pain and a feeling of twitching in the eye; then immediately the sight began to go. The manner of this occurring is very peculiar: the failure is always at the nasal side first, and the sensation is as though a veil were being drawn before the sight; this veil becomes denser and denser until vision is absolutely lost. This loss is complete for a period of time varying, as has been said, from one to five minutes, and then sight begins again to return. Vision first appears again to the temporal side, and with a peculiar play of phosphenes or subjective sensations of light. The author does not say what length of time the gradual restoration of vision occupies; but there is always a moderate amount of pain deep in the orbit afterwards.

In the ophthalmoscopic picture there was at the moment of first examination little to remark, and vision was at the time nearly normal; but, fortunately for science, before the séance was over the patient reported that an attack was about to come on. At once recourse was again had to the ophthalmoscope. Harbridge watched the pupil dilate and the inferior temporal artery gradually diminish in calibre more and more until it was completely "collapsed." ("Collapsed" is the word employed by the author, but it is open to question whether that term gives a correct description of the state of the vessel.) Immediately thereafter the same change took place in the inferior nasal and in the superior branches; and, following quickly upon the arteries, the veins underwent a similar alteration, beginning with the inferior temporal. At the same time the disc became more pallid, especially about its edges, and against this pallor the flattened and ribbon-like vessels stood out very strongly; then a faint haze spread over the retina. This condition lasted for a brief time, and then the arteries, and after them the veins, began to fill; indeed, became greatly distended. Vision, it is interesting to note, did not return at the same moment, but *followed* the restoration of circulation.

The patient's vascular system was carefully examined by a physician, who reported that there was no lesion of lung, heart, or kidney, and only a slight degree of sclerosis of vessels: he

found nothing suggestive of thrombosis of vessels, embolus, or endarteritis.

The only conclusion to which Harbridge was able to come was that the condition was one of spasm of the artery, probably from the action of an intestinal toxin. This origin of the poison was suggested by the fact that after free purgation the symptoms altogether ceased.

W. G. S.

E. LOPEZ. **Migraine.** *Recueil d'Ophthalmologie*, June, 1906.

IN a short paper Lopez summarises his experience of cases of migraine. He finds it occurs in 14 per cent. of all eye cases. He believes it to be purely a reflex disturbance from muscular stress, either in accommodation or in extraocular muscular insufficiency. He found asthenopia 1,003 times in 8,000 eye cases: of these 251 were emmetropic, 364 hypermetropic, 71 myopic, 213 astigmatic, 104 anisotropic. The majority were adults. Most of the migraine cases were associated with astigmatism. Extra-ocular defect was almost always weak power of convergence. He finds frontal pain is almost always associated with accommodative errors, and occipital pain with extra-ocular muscle defect. The importance of reducing any disability in the muscles of convergence cannot well be exaggerated; the fatigue and headache produced by over action of these muscles can easily be demonstrated by an evening's amusement in prism problems, and it is no less important to see that glasses ordered for the correction of accommodative errors are so adjusted as to help convergence and not to increase the difficulty.

N. BISHOP HARMAN.

AUGIÉRAS (Laval). **Symmetrical Abnormality of the Internal Canthus Relieved by Cantheroplasty.** *Recueil d'Ophthalmologie*, June, 1906.

THE case was one of epicanthus of marked character, for the fold covered over the inner part of the cornea and caused a most odd appearance, particularly objectionable in a girl of 19 years. Augiéras passed probes in both canaliculi of one eye, depressed them so as to get the canaliculi well out of the way,

then split the fold of skin. After considerable difficulty a sufficiency of conjunctiva was dissected off from the caruncle and globe and stitched over the raw place to the lips of the wound. The patient made a rapid recovery, and was pleased with her improved appearance.

N. BISHOP HARMAN.

CLINICAL COLUMN.*

A SUGGESTION RESPECTING CATARACT GLASSES.—If we could alter the distance between the lens and the retina, we could theoretically obtain definition for any desired distance without changing the curvature of the lens. This is not, of course, feasible under ordinary conditions, but in persons who have been operated on for cataract, we have, so to speak, the lens under our control, and this method of changing the focus of the eye becomes a practicable one. I have, during the last year or two, in the majority of my cataract cases, given glasses of one strength only—that for distant vision—directing the patient, when he wishes to read, to pull them down the nose until he obtains the proper focus. It will be found that about one inch from the eyes is the distance which is generally required, and also that the position which the glasses assume when thus pulled down is a convenient one for near work—that is, they are somewhat below the level of the eyes, and the plane of the lenses becomes tilted so as to be approximately at right angles to the line of vision. The field of accurate definition is no doubt restricted as compared with that given by the lenses close to the eyes, but it is still sufficient for practical purposes; and the size of the image obtained is somewhat greater. The centring of the lenses is, of course, incorrect, and with their high curvature the prismatic effects should be pretty marked; but, as a matter of fact, I have not, so far, found any patient complain of difficulty which I could attribute to this cause. The convenience of having to carry only one pair of glasses, instead of two, needs no insisting on; and I would venture to suggest to anyone who may be unfamiliar with it a trial of this simple shift.—W. G. LAWS.

**For which we shall be glad to receive reports of minor clinical importance.*

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

The President, Mr. PRIESTLEY SMITH, in the chair.

PAPER.

Congenital Distichiasis.—Mr. A. R. Brailey.

Mr. Brailey, in this paper, brought forward the notes of a case which had come under his own observation, and after referring to four cases described respectively by Kuhnt, von Becker, and Herrnheiser, as well as four additional unpublished ones from Professor Fuchs' clinique, proceeded to discuss the subject from a pathological and developmental point of view.

In all cases the clinical features were similar, viz., the presence of a definite single row of fine, delicate, almost colourless hairs, about half the length of ordinary cilia, growing from the whole length of the posterior margin of both lids. Where a satisfactory microscopical examination had been possible it was found that the theibomian glands were entirely absent, and that the hairs projected from orifices corresponding to the situation of the ducts of these glands had they been present, suggesting the idea that the hairs had been produced in some way as a result of mal-development of the epithelial invagination intended for the formation of the theibomian glands and ducts. There was found also an increase in the number of Moll's glands, apparently as compensation for the imperfect glandular formation elsewhere. Mr. Brailey concluded by suggesting that the term *Distichiasis* might be more appropriately reserved for this congenital condition rather than for any other form of ingrowing lashes.

This sitting was chiefly occupied in the transaction of business.

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COMPENSATION FOR INJURIES TO THE EYE.

By WILLIAM GEORGE SYM, M.D.

IN the course of his hospital work every ophthalmic surgeon is frequently consulted in regard to questions of compensation and fitness for work after injuries, and it must be confessed that the state of affairs at present existing, in which there are no sufficient rules to guide him in his estimate of the severity of the injury, is far from satisfactory. One has to be guided almost entirely by one's individual opinion of the capacity of an eye to perform work of which one has no definite practical knowledge. I therefore have gradually come to the conclusion that certain writers are correct,—I believe the suggestion first emanated from France,—who believe the proper course to be that trades should be investigated and classified according to the amount of sight required for the proper performance of the work. We must get to know from consultation with practical workers, and from examination of them, what is the minimum of visual acuteness requisite for each trade, and whether binocular vision is or is not an absolute essential. This has to some extent been done in some foreign countries, but has not been carried out officially in this, and I am not aware that there has been any definite attempt to decide what is the actual minimum. For certain trades full vision is a necessity, but not necessarily binocular full vision, and perhaps not necessarily binocular vision at all; for certain others binocular vision is an absolute necessity, but not necessarily full vision with either eye; for yet others vision is not necessarily either full or binocular. As examples of the three classes I might take the trades of watchmaker for the first, of joiner for the second, and of miner for the third. This is a matter in which I think a committee of the Ophthal-

mological Society might obtain valuable information and give much-needed help in settling difficulties.

Another point in connection with this question, too, which requires attention, is that surgeons are apt, I think, to lay too much stress upon the state of the distant vision—a habit acquired from the necessities of the more scientific part of our work. What really counts is the capacity to see well at 10 to 30 inches. Thus, even if a man has only $\frac{6}{18}$ or $\frac{6}{12}$, he may yet be perfectly efficient at 12 inches—he may be every whit as efficient, visually speaking, as if he had $\frac{6}{6}$. I think it is most unfortunate, too, that our method of recording vision has come to be regarded at times by educated laymen (advocate, barrister, judge) as a vulgar fraction, and to this the very unwise conduct of some ophthalmic surgeons has largely contributed. The surgeon ought to know better than to record as $\frac{1}{2}$ or 0·5 what ought to be recorded in the form of $\frac{6}{12}$: to do so does not convey the information required, and actually leads to a complete misapprehension. No surgeon, I imagine, would seriously maintain that a person whose visual acuteness had formerly been $\frac{6}{6}$ had actually lost half of his sight when the distant vision became reduced to $\frac{6}{12}$, yet that is how the layman is apt to read it if the record bears 1 and then $\frac{1}{2}$, as though the sign indicating the distance at which the test was made were merely the numerator of a vulgar fraction. I have found it needful at times to make this clear, and prevent a serious misapprehension.

The claim made by the litigant is as a rule that he is rendered unable to work at his trade or occupation, and if that be so the point to be borne in mind by the surgeon who is to report or give evidence on the matter is not that the person's vision is now $\frac{6}{18}$, brought up to $\frac{6}{9}$ with a + cyl: (or some similar intricate affair), but—Is it possible for a man with only the amount of vision the pursuer (plaintiff) possesses to work at this occupation—in nine-

teen cases out of twenty the person not being allowed the benefit of any lens. In order that this may be fairly estimated I think we ought, as I have just said, to take evidence as to the actual vision of those engaged in that occupation. No one of experience, I think, will seriously maintain, for example, that every hammerman has $\frac{6}{6}$: there must be many men engaged at that work whose vision falls very considerably below that standard, and therefore a reduction of vision which still allows the person to possess $\frac{6}{12}$ must not necessarily be considered as permanently incapacitating the worker. I know of one instance in which a very similar degree of reduction of vision in one eye only of a man engaged at just such a trade was skilfully paraded before an ignorant jury, and the claimant, on the ground that he was permanently "put on the shelf" and could not work at his trade, received a large sum from his former employer in compensation for injury. He immediately went to another firm and obtained work at his own trade at the standard rate of wages! There is no doubt in my mind that in a number of cases like this a serious miscarriage of justice is the result. I have been engaged in cases too where a miner has sought to obtain from his employer a permanent weekly compensation on the ground that having lost one eye from injury when at work he was therefore unable to work below ground; and this although it is known that there are numerous instances of a miner working underground who possesses only one eye. The medical witness must bear in mind that the question depends upon the *ability* of the patient to work, not upon the *wisdom* or unwisdom of his continuing to follow a given dangerous occupation: of that point the law naturally takes no cognisance.

To return to this matter of the lower limit of vision which will enable a man to work at each trade, and until we know which we shall not get much further forward, there are two points at which a little hardship is apt to

come in—first, that for a considerable period of time, varying under varying circumstances, a man who has suddenly lost even a small proportion of his acuteness of sight is considerably handicapped at work; second, that there are many employers who would willingly keep on a partially incapacitated man at a smaller wage than he formerly earned, but larger than the mere legal proportion of his former wages would be, were he incapacitated, did not the trade union forbid it. The employer is unwilling to pay full wages to a man who cannot produce his full tale of good work; the union will not, I believe, allow the employé to work for less than the standard wage and so undersell others: between the two he goes idle, or falls from being a skilled workman to the rank of a mere labourer. It is not necessary or desirable to discuss here the merits and demerits of trades unions, but this effect of their action should be noted in the present connection.

One difficulty in the way of this suggestion as to a minimum visual capacity is that it would almost necessitate that a worker seeking employment should produce evidence that he possesses at least this minimum. If such a one is employed, and during work has one eye injured, so long as he is not injured sufficiently to lower his vision below the minimum, he would not be entitled to compensation,—at least not on that ground,—but if his vision was reduced below that, no other employer would take him on, if he were wise.

Another method at arriving at an agreement without—so far as possible—appeal to the complicated and costly machinery of a law court, would be to have a scale of compensation agreed upon previously in case of any accident happening. For complete permanent inability to work at his old trade a man might be entitled to a certain fixed proportion of his wages, and if this had been awarded his Health Card should be endorsed to that effect, to prevent him from taking on such work while in

receipt of compensation on that scale. This would prevent such a fraud as I have indicated was actually perpetrated by a successful litigant. By Health Card I mean the record which I have above suggested the skilled worker would require to produce when entering with a new employer, much as a sailor does. This card or record would show whether his vision was below the minimum standard or no, and whether he was in receipt of compensation, and without it no employer would accept a new worker, or would do so at an enhanced risk. Then again, for complete loss of one eye he might be entitled to a certain proportion of wages, even if this did not entail incapacity; for partial loss so much less.

Here again there is a difficulty, for unless the Health Card system were also adopted there might be hardship to employer or to employed. Two men, A and B, are engaged at precisely similar work, and each of them has the misfortune to lose his right eye. Should they receive the same sum of money in compensation? At the first blush one is apt to say, "Certainly, for each sustained the same injury, viz., the loss of his right eye," but the actual loss may for all that be much greater in the case of one of the men than in that of the other. A may have formerly possessed $\frac{6}{6}$ with his right eye and $\frac{6}{36}$ with his left one, while B's right and left eyes each had $\frac{6}{12}$. A may thus, on loss of the right eye, have lost his working capacity for that trade altogether and must take a lower place in the world; while B, after a brief period of inconvenience from loss of binocular vision, is soon at work again, not much the worse for his accident. The two injuries are thus seen to be of very varying degrees of ultimate effect, and would of course be differently compensated.

I have hitherto made no mention of the formulæ suggested by Magnus, Berry and others, for mathematical calculation of the degree of loss sustained when vision is reduced to such and such a degree, when hemianopsia is pro-

duced, when paralysis of one ocular muscle is present, etc., etc. I have refrained from mention of them because my belief is that they attempt the impossible. The formulæ involve so many assumptions, and so purely arbitrary allowances for this and for that, that in my opinion, while I admire the ingenuity of their construction, they lose their practical value altogether. They signalise an attempt to settle by pure mathematics matters which are not amenable to mathematical calculation, in which there are too many uncertain factors involved, and for which arbitrary assumptions are made the basis of algebraical formulæ. They will never, I think, command the allegiance of the profession and still less of the law.

My suggestions then are: (1) That there should be drawn up a list of trades classified according to the amount of vision, and more especially of near vision, absolutely required for each. (2) That each skilled workman should have a Health Ticket showing (besides such matters as, *e.g.*, that he was operated on for appendicitis or has lost one and a half fingers of his left hand) the actual state of his vision. Any employer who accepts a worker without this will of course expose himself to extra risks. (3) That for loss of an eye (leg, etc.), such and such a proportion of wages, paid as an annuity or commuted for a lump sum, should be the acknowledged compensation without the necessity of a legal process. For a man belonging to the trades for which binocular vision is not an absolute requisite this would form the compensation for injury; where the nature of his occupation does not absolutely demand binocular vision this sum would have to be allowed for in fixing the total award.

I believe that were these points agreed upon there would be less speculative, wasteful, and not always honest, litigation, and less opportunity for that unfortunate conflict of medical evidence which brings so much discredit upon the profession.

REVIEWS.

STEINER (L.), Java. **Pigmented markings of the conjunctiva.**
Annales d'Oculistique, June, 1906.

ALTHOUGH rare in man, and especially in white races, it is quite usual to find pigmented areas of the conjunctiva in coloured races, the site being usually the exposed portion of bulbar conjunctiva on each side of and adjacent to the cornea. (It has been noted that areas of pigmentation are frequently seen in the conjunctiva of the lower animals.) In man, great variation is encountered in the intensity of such pigmentation, as well as in the form and in the extent of the discolouration.

The cause has generally been ascribed to exposure of the conjunctiva to the influence of the strong sunlight of tropical countries; in coloured races such exposure is more prolonged and intense in degree than would ever be possible in the case of individuals of white race resident in the same environment. It is held that such a theory of reaction is analogous to the action of sunlight in milder climates producing pigmentary changes in the exposed surface of the skin of the body.

There is another form of pigmentation seen throughout the East, quite distinct from the foregoing: this occurs as uniformly dense patches of black pigmentation, well defined and of irregular form, varying in size, usually situated under the inner surface of the eyelid on the palpebral surface of the tarsus: less frequently these are noticed in the conjunctival fornices, but at no time are they observed on the bulbar portion of the conjunctiva. They are of comparatively small size, not usually exceeding an area equivalent to that of $\frac{1}{8}$ of the cornea: they bear a general resemblance in appearance to the patches of black colouration not unfrequently seen inside a dog's mouth, although they differ from these in being of much smaller size and being isolated and single. Although the author, at some length, associates these accumulations of pigment seen under the eyelid with the occurrence of trachoma, it is undoubted that other competent observers have elsewhere found this peculiarity quite distinct from, and irrespective of, the presence or previous existence of this particular local affection, or indeed of any other. In any case the author fully coincides with the opinion that such appearances are quite free

from any bearing of pathogenic importance; also, that their existence does not indicate any predisposition to the later appearance of melanotic new growth, which, it may be said, is an exceedingly rare form of tumour, more especially in the East.

KENNETH SCOTT.

BACH (L.), Marburg. **The Conception and Localisation of the Loss of the Pupil-reflex to Light.** *Die Ophthalmologische Klinik.*, June 22, 1906.

THE loss of the light-reflex of the pupil is an affection that still awaits precise localisation, and, indeed, an exact conception. This reflex immobility has been so much confused with amaurotic and absolute immobility, that one welcomes another attempt to provide a satisfactory definition. Bach, in this article, suggests the following:—

A pupil is reflexly immobile if it reacts neither directly nor indirectly to light, nor to nervous or psychical stimulation, but contracts promptly and fully upon convergence.

The subjoined table shows how this definition marks off reflex immobility, even bilateral, from bilateral amaurotic immobility, and also from absolute immobility of the pupil.

	Reflex (in tabes, bilateral, with optic atrophy)	Amaurotic (bilateral)	Complete	Absolute Incomplete (paralysis and paresis of sphincter pupillæ).
Direct and indirect light reaction	Absent	Absent	Absent	Absent
Nervous and psychical reaction	Absent	Present		
Convergence reaction	Prompt and very full	Not so easily and fully	Absent	Slowly and less fully
Pupil-unrest	Absent		Absent	Absent
Size of pupil	Narrow 2·5 mm. and unrest	Wide	3·5 mm. and over	

Bach's insistence upon the sharp differentiation amongst the three kinds, and his opinion that, though absolute immobility may occur where reflex immobility already exists, the two conditions are probably due to lesions in different situa-

tions, instead of the one being a consequence of the other, is largely based upon Füstner's findings, that, in tabes and paralysis, different parts of the nervous system may be independently affected.

But where is the lesion causing the reflex immobility to be located?

A theory, but without sufficient foundation, is that it depends upon a disturbance in the central grey matter or in the corpora quadrigemina. Many authorities explain it as a destruction of a fasciculus between the optic tract and the nucleus of the oculo-motor nerve, but clinical facts are opposed to this. Others locate the lesion in the nucleus of the oculo-motor nerve (especially in the nucleus of Edinger-Westphal), in the roots and trunk of the oculo-motor, in the ciliary ganglion, in the ciliary nerves and the optic nerve; some of these explanations are certainly disproved, and others are improbable. The theory, too, of an elective affection in the centrifugal reflex arc has not much probability in consideration of clinical observations, though exceptionally it may be applicable. The attempts to localise the seat in the cervical spinal cord, made especially during recent years, have led to completely contradictory results,—these contradictions perhaps being due to the fact that the cases examined have not been exactly similar.

Bach accepts the view that the disturbance, which leads on the one side to reflex immobility, and on the other to myosis, is not to be found in the same situation. As he indicates, those cases of reflex immobility with pronounced myosis have usually changes in the posterior columns of the cervical spinal cord, the loss of sensory stimulation thus produced accounting for the myosis, although the reflex immobility in tabes is not directly dependent upon the affection of the cervical spinal cord.

He holds that the reflex immobility is produced by the absence of a tract which extends from the corpora quadrigemina to the medulla oblongata, or, in some cases, transitorily, by irritation of an inhibitory centre lying there, and that the myosis is dependent upon the absence of sensory spinal tracts, and the loss of psychical irritation from tracts which extend from the cerebrum to the medulla oblongata.

Bach and Hans Meyer, relying upon their own experiments, hold that it is necessary to accept the existence of an inhibi-

tory centre for the light-reflex and pupil dilatation at the distal end of the medulla oblongata. This opinion they adhere to in consequence, mainly, of experiments upon a case in which, through exposure of the medulla oblongata, myosis and reflex immobility of the pupil occurred and were watched for over an hour; and then, by means of a frontal section through the middle of the medulla, this was immediately abolished and the existing reflex converted into a prompt light-reaction with medium pupil dilatation, lasting until the death of the animal. This does not provide strict proof of the theory, of course, because the convergence-reaction could not be tested. And, further, it may be that the pupil conditions are not the same in man and in the lower animals.

D. MATHESON MACKAY.

ABADIE (Ch.). **Indications for iridectomy in irido-choroiditis.**

• *Annales d'Oculistique*, June, 1906.

IN cases of general uveitis attention is here drawn to the benefit to be derived from performance of an iridectomy, in addition to the usual external topical applications, along with the inward exhibition of mercury and salicylate of soda. The advantage of iridorhexis is also urged, for those cases where there are synechiæ, as the latter operation decreases the acuity of any subsequent attacks of inflammation, besides diminishing the tendency to recurrence.

Whilst Desmarres recommended that an iridectomy should be performed in those cases where there were even only a few posterior synechiæ, and von Graefe laid principal emphasis on its employment where there was complete exclusion along with iris bombé, the author recommends the operation being performed in all instances where the case does not yield readily to the ordinary means already indicated, and this even although the formation of synechiæ seems insignificant in extent. He considers that the benefit from the operation accrues by the paracentesis of the cornea, the escape of the aqueous humor, and, more especially, by the fact of exposing the portion of the lenticular surface subjacent to the iris, and so discovering the progress of the morbid process as it occurs in that situation.

Mention might also have been made of the antiphlogistic

effect of the local depletion produced at the time of operation, as this is important and has direct bearing on the favourable aspect often produced by such operative interference; and, furthermore, if the iridectomy is made early in the case, the exposed lens surface is naturally less implicated and may therefore be expected to remain comparatively free from exudate, and be useful afterwards if that portion is required for visual purposes.

Deserved stress is laid on the recognised fact that the performing of such an iridectomy is entirely an aid, and must on no account be regarded as a substitute for the general and other local treatment: these being rigorously maintained throughout the whole course of the case.

KENNETH SCOTT.

VALUDE (E.). **Anterior polar cataract.** *Annales d'Oculistique*, June, 1906.

THIS is regarded either as an intra-uterine occurrence, due to an intra-ocular inflammatory process; or, on the other hand, it may be extra-uterine in point of occurrence, due to ophthalmia at the time of, or after, birth: and this, besides those cases of infective keratitis where the surface of the lens opposed to the pupil-aperture becomes subjected to certain changes, associated with the formation of opacity.

The author cites a case in which a combined double origin gave rise to the condition:—

There was congenital malformation, in addition to some intra-uterine occurrence of ocular inflammation. This was evidenced by traces of capsular membrane, in addition to a small coloboma of the choroid from ante-natal inflammation.

Another case is given in detail, showing its occurrence due to corneal infection with a total absence of perforation:—

A child, 8 days old, was the subject of non-specific inflammation of the conjunctiva with formation of false membrane; later, this developed into dense general opacity of the cornea, but with total absence of ulceration and, throughout the entire duration of the case, without any perforation. Syphilitic symptoms presently appeared in the body, and constitutional treatment was given, with the result that the condition im-

proved. When the child was seen again after the lapse of 11 years, there was a small well-marked anterior polar cataract present in each eye.

The author recognises the distinction between such a form of cataract and *pyramidal* cataract originating from perforation of the cornea.

KENNETH SCOTT.

TRUE (H.). **Retraction of the elevator-muscles of the lids.**
Annales d'Oculistique, June, 1906.

THE condition described by True, and of which cure was ultimately effected after resort to operative measures, presented the following features:—

There was complete retraction of both upper eyelids, with permanently imperfect closure of the palpebral aperture, persisting even during sleep: there was consequent irritation of the surface of each eyeball due to constant exposure.

The patient was a man of 60 years old, with a fair history, and personally otherwise in good health. Succeeding an attack of influenza in the previous year, he complained of slight intermittent pains in the eyes, which had latterly increased in severity and become quite continuous, accompanied at first by difficulty, and subsequently by complete inability, to close the palpebral aperture. The only other subjective symptoms were an attack of facial neuralgia, persisting for about four days, six months before his influenza: also, he had been subject to lightning pains in the left leg over a period of eight years.

On examination of the eyes, the visual acuteness was found defective owing to advanced senile cataract. The upper eyelids did not follow the downward rotation of the globe, and on his making the attempt to close the eyelids completely, the lower one in each eye alone responded. With the exception of the muscles implicated, all the structures of the eye seemed to be normal.

Reference is duly given to three previously recorded instances of a similar condition.

General treatment had proved unavailing; and in view of the advanced age of the patient, local measures were preferred. Several of these were tried without benefit, so resort to opera-

tion was incumbent, as the patient became insistent on account of his condition causing him much inconvenience.

The upper border of the tarsus was exposed through the skin surface, and was freed from its muscular attachments along its whole length, dissection only being arrested on reaching the palpebral conjunctiva. An accentuated condition of ptosis was thus induced, which, however, did not interfere with the patient's power of opening the palpebral fissure. The wound in the skin was closed by sutures and after an interval of two weeks he was pronounced to be cured, a result which was confirmed on further inspection two months later.

KENNETH SCOTT.

A. BEAUVOIS (Paris). **Ocular Injury produced by Watching Eclipses of the Sun.** *Recueil d'Ophthalmologie*, May and June, 1906.

THE six cases of which Beauvois gives details were seen immediately after the partial eclipse of the sun occurring on August 30th, 1905, which was visible in Paris. All the patients, save one, were women of adult age. The symptoms were generally slight: some headache, slight reduction of vision, with disturbance of central colour perception, and in some cases changes were seen about the macula. In almost all there was a speedy and complete recovery.

The greater part of this lengthy paper is taken up with an exhaustive review of all the cases of this nature which have come under his notice in a wide range of literature. His historical review ranges from Aristotle, Lucretius and Galen to the present time. He quite does justice to British authors,* but he rejects Sulzer's opinion that our own Mackenzie was the first to place on record cases of this order, and one is forced to agree that Sulzer was not quite accurate.

N. BISHOP HARMAN.

* He omits, however, a valuable paper by Mackay, in *Ophthalmic Review*, 1894.

SCHIECK (Göttingen). **The Melano-sarcoma as the only form of Sarcoma occurring in the Uveal Tract.** J. F. Bergmann, Wiesbaden, 1906.

THIS book is divided into two sections. In the first the histories and reports of examination of 24 white and pigmented sarcomata are given. Under these are included the so-called spindle-celled sarcoma, angio-sarcoma, perithelioma choroideæ, &c., partly as leuco-sarcomata, partly as mixed pigmented sarcomata and pigmented tumours. The first case described is especially interesting, as here in one and the same tumour areas were to be found showing typical pure unpigmented round-celled sarcoma, typical unpigmented spindle-celled sarcoma, mixed pigmented spindle-celled sarcoma, and, finally, melano-sarcoma. Other cases, again, show two of these types occurring together.

In the second section, as the result of the reports of examinations, the argument is advanced that these so-called typical tumours are only stages of one and the same kind of tumour, viz., the melano-sarcoma.

That these tumours can show such a variety of forms is accounted for by Schieck by the fact that the appearance of the tumour depends on—

- (1) The stage of development which the tumour cells (chromatophores) have reached.
- (2) The part which the vascular supply plays in the growth of the tumour.
- (3) The form of the pigment.
- (4) The appearance of degenerative processes.

As regards the stage of development of the chromatophores, exactly the same forms are found in the sarcomata as in the foetal uvea.

The first development is characterised by small uncoloured round cells, which gradually through growth pass into spindle-cells.

At the earliest the chromatophores are capable of producing pigment in the spindle-cell stages. Thus, from an unpigmented spindle-celled sarcoma results a mixed pigmented or an absolutely pigmented spindle-celled sarcoma.

The culminating point in the development of the melano-sarcoma is reached through the transition of the pigmented

spindle-cells into pigmented branched cells—that is to say, growth into typical chromatophores.

Whilst through these various stages of development of the tumour cells manifold images arise, yet the variations are still greater owing to the tendency of the chromatophores to grow parallel to the newly-formed vessels.

Formerly, owing to this peculiarity, one was misled into talking of angio-sarcoma of the choroid because one believed that the cell-brood in the neighbourhood of the vessels arose from the perithelium or endothelium of the vessels.

Nevertheless, the further growth phenomena in the cell mantle teach us that we have to do with a young brood of chromatophore cells, then the cells grow gradually into pigmented spindle-cells and typical chromatophores, and through this are distinguished quite sharply from the peritheliomata and endotheliomata. Further, the appearance of the melano-sarcoma can be altered through the occurrence of pigment changes. At first this appears in the form of fine pigmented granules in the cells, and never gives the iron-reaction. When the cells degenerate the pigment runs together into coarse granules, and the iron reaction appears.

These granules have nothing to do with pigment genesis, and one formerly, owing to the presence of iron and the resemblance of the granules to the red blood corpuscles, wrongly adopted the theory that the pigment was produced through a blood metamorphosis. On the contrary, pigment of such a character is only found in degenerating chromatophores incapable of living, and is therefore likewise a product of degeneration.

Finally, yet other degenerative processes can influence the appearance of the melano-sarcoma. Such are the formation of cartilage, bone or mucoid tissue in the tumour.

Upon the ground of the foregoing analysis Schieek comes, in the third part of the monograph, to the deduction that all cases of uveal sarcoma reported as leuco-sarcoma, angio-sarcoma, perithelioma, &c., are in reality wrongly described cases of melano-sarcoma, and therefore the melano-sarcoma is to be regarded as the only form of sarcoma occurring in the uveal tract.

Included in the text are many instructive illustrations, to which are added three coloured plates from drawings made by the author.

R. PULLEINE.

F. PINELES (Vienna). **Cataract in Tetany, Diabetes and Old Age.** *Wiener Klin. Wochenschr.*, 23, 1906.

THE influence of constitutional diseases on the nutrition of the various parts of the eye is so important that in enquiring into the etiology of many pathological conditions in the eyeball, *e.g.* of the lens, the possibility of some constitutional cause must not be overlooked. Pineles here discusses the presence of cataract in certain diseases connected with changes in blood-glands.

Cataract occurs in the various forms of tetany, and, according to Pineles, this fact suggests a common pathogenesis of the different types of this disease. He observes that it is not due to the spasms or epileptiform convulsions *per se*, for the literature shows that the subjects of true epilepsy and hysterical fits are not specially liable to cataract; and it is found, further, that it does not occur from spasm of the ciliary muscle after prolonged use of eserine.

Insufficiency, or absence, of the thyroid gland, as in endemic cretinism, does not appear to be specially conducive to the formation of cataract, but in tetania strumipriva the want of the "epithelial body" is found to be an essential factor, and in the absence of this body, which he reckons among the "blood-glands with internal secretion," it is held that some toxine is free to act, whereby it apparently selects structures of epiblastic origin, *viz.*, the nervous system, the hair, nails, and lens.

Diabetic cataract is also cited as another example of this condition arising from a constitutional cause: and he points out that the appearance of glycosuria and diabetes is frequently attributable to changes in glands with an internal secretion, *viz.*, the pancreas, thyroid gland, and suprarenal capsules.

In analogy to these two forms the writer also suggests a connection between senile cataract and changes in the sexual organs accompanying old age, which in its clinical manifestations shows symptoms similar to those observed in the disease of blood-glands.

THOMAS SNOWBALL.

B. WICHERKIEWICZ (Cracow). **A simple Operation for Staphyloma of the Cornea.** *Klinische Monatsblätter für Augenheilkunde*, July-August, 1906.

THE choice of the best operation to be performed in a case of staphyloma affecting the whole cornea, or nearly the whole, is a matter of considerable importance, it being understood that an attempt is to be made to preserve the eye. Mere removal of the staphyloma, or of a wedge out of the most projecting part, and closure of the wound with catgut stitches, exposes the stump to the risk of septic infection, and the latter method is applicable only if the walls of the part left behind are sufficiently tough and resistant to hold the thread, which is not by any means always the case. Catgut threads are apt to soften and give way too soon and so permit of a late infection, while silk and silver, on the other hand, cut their way through the tissues. Conjunctival sutures or stitching of the sclerotic is almost certain to lead to shrinking of the globe (we should rather have said it involves serious reduction of the size of the globe), which in the interests of the cosmetic result it is important to avoid.

Wicherkiewicz applied a different method of procedure in the case of an infant of six months, and did so without requiring to produce general anæsthesia. The child had suffered from ophthalmia neonatorum, and when first seen had in one eye a large staphyloma, protruding greatly: only the upper part of this was at all transparent, and even that part was far from clear. Tension was $+1$. An iridectomy upwards was performed, and tension became reduced to normal: the projection also diminished somewhat. About a couple of months later the child was brought back, the staphyloma having greatly increased, and the tension being $+2$: it was only with difficulty that through the semi-opaque cornea the coloboma in the iris could be made out. Wicherkiewicz decided to operate again, and proceeded after the following manner:—With the eye under cocaine he punctured the staphyloma with a Bowman's needle: the aqueous then escaped and the walls of the staphyloma collapsed in folds. The middle portion of this was then seized in forceps, lifted up, and an oval portion cut off from it as broad as the cornea and about 4—6 m.m. in height. The edges of the wound lay so precisely in contact that it was not necessary to introduce a stitch, and the application of a simple

pressure bandage completed the procedure. Healing was uninterrupted, and, after a little time, the scar was almost invisible, and the transparent portion of the cornea somewhat broader. Tension was normal. Three months later the curvature of the former staphyloma was almost exactly that of a normal cornea, and the globe appeared to be of the same size as the other: the transparent portion of the cornea was decidedly broader than it had been.

This operation, which can, as above noted, be performed without the employment of a general anæsthetic, is plainly not applicable if the lens is adherent to the posterior surface of the protrusion, and one cannot always be certain beforehand whether this is so or not, but if on puncture of the anterior chamber the lens is found to occupy a forward position a different operation can at once be substituted for this.

W. G. S.

O. LOEWE (Frankfort-on-Main). **Transient Lead Amaurosis.** *Archives of Ophthalmology*, 1906., ii., iii.

J. GALEZOWSKI (Paris). **Lead Amaurosis.** *Archives Générales de Médecine*, 1906, 26.

LEAD causes blindness in two forms: a permanent amaurosis with fundus changes, and a transient loss of vision. The former is usually gradual in its onset: the latter is abrupt. There appears to be, also, an intermediate form, as illustrated by the case of Paci, whose patient was a soldier with a leaden bullet in his humerus. This man suffered from a transient amblyopia succeeded by complete amaurosis.

The very unusual occurrence of a transient amaurosis caused by plumbism took place in the person of a man, aged 24, of whom Loewe gives an interesting account. According to him only five cases have occurred since the introduction of the ophthalmoscope, and naturally enough one must look with a little suspicion upon cases which occurred previously to the introduction of an instrument so necessary for the elimination of possible errors in the diagnosis of such a condition as this. We agree with the author that under the circumstances each new case should be carefully reported.

The patient, who was blind when he came to Loewe's clinique,

gave the following account of himself:—For two and a half years he had been engaged in a certain kind of work at which the workers were greatly exposed to lead poisoning, but he himself had not suffered, perhaps because he had attended to the ordinary means of prevention. Though able to work up till two days before he presented himself, he had suffered severe pains in the head and body for a week, and had lost appetite. He knew that the vision of the left eye had always been superior to that of the right, and during his military service he had required to aim with his left eye, but apparently even in it his vision had not been perfect. It was not until the evening of the day preceding that on which he presented himself that vision had been seriously affected: during that night, however, he struck a match and found to his horror that he had no perception of light.

Eliminating less important matters, we are informed by Loewe that his nutrition was fairly good, that his face was red with a slightly yellow tinge, that his limbs were freely movable, and that the facial muscles responded promptly. Most of his teeth were carious and on the gums was a distinct blackish grey line; breath was fetid, the abdomen was neither distended nor drawn in, but palpation of it made him uneasy. He complained of a good deal of headache and dizziness, of colic and bad appetite, and of considerable thirst. For four days he had passed neither urine nor fæces. As regards the eye, there was no paralysis of movement: his pupils were greatly dilated and reacted only to a very slight extent. In the fundus no pathological changes of any kind were visible: no hæmorrhages, no pigmentary anomalies, no changes in the vessels. Amaurosis was complete.

The treatment employed consisted in ice to the head, castor oil, iodide of potassium, and the wet pack. Next day the bowels moved and the patient was a trifle easier, but no urine was passed, and he was still completely blind. On waking next day he could count fingers at 1 m., and he passed [how much?] water, which contained traces of albumin. A few days after this he could see much better and there was no albumin in the urine: the yellow tint of sclerotic, &c., which had been quite obvious, had now become much less marked: the headache and colic were also much relieved. In less than a month his vision became $6/_{18}$ (R.E.) and $6/_{12}$ (L.E.), with a normal field and normal colour perception: the fundus remained per-

fectly normal. In two months from admission all symptoms were gone and he was discharged cured.

To account for sudden and complete loss of sight while the media and fundus remain normal the affection must be central, and there are but few possibilities in the way of a cause; unless it be from sudden loss of blood it must be a toxine of some kind or another, if we exclude Jacksonian epilepsy and hysteria. Now, in this patient there was no loss of blood, and, as he had no quinine, uræmia was the most probable toxic origin. The anuria, as well as the headache, nausea, and giddiness, is in accordance with this suggestion, while the line on the gums and the foetor of breath rather point to lead.

The case under discussion is one of transient amblyopia, and in all the instances hitherto described there has been a great measure of similarity. After the initial complaint of malaise and discomfort, all perception of light rapidly disappears,—in a few hours it is gone,—and along with this symptom there is increase in the headache, and there are also head symptoms—delirium even, and colic. The pupils become dilated; but may react slightly to light. There is no change in the fundus, be it observed, to account for the loss of vision, from which in a few days the patient recovers. In most of the cases albumin has been found in the urine, and sometimes tube casts.

Three theories have been put forward to explain the onset of this transient amaurosis, of the truth of none of which is there any definite proof. The first of these is a "nervous disturbance." No one knows exactly what this phrase may mean, so that it is difficult to refute. Leber suggests that in this condition the lead, which ordinarily is excreted by the kidneys, is retained and acts directly upon the nerve tissue. The second suggestion is that of a uræmia: in the way of the acceptance of this there are great difficulties. It is easy enough to say that the patient has albuminuria and headache, and that thus one has the elements of an attack of uræmia ready to hand, but clinically the two affections are entirely distinct. There is very little albumin and sometimes none, and tube casts are rare; there is not always any mental symptom (unconsciousness) or convulsive seizure; and, further, there is the fact that the patients all recover. The author admits that the scantiness of the urine is a point in favour of this theory, but explains it rather by the retention of much fluid in the

intestine on account of its spasmodic colic, an explanation which does not strike one as very convincing. The slight trace of albumin may be accounted for by the irritation caused by a highly concentrated fluid. The third theory is that of a sudden ischaemia of the eye with necessary temporary abrogation of function, and this is the theory which Loewe endorses. It is known, through the sphygmographic work of Riegel, that increase of arterial tension precedes the subjective symptoms of lead colic, and it is probable indeed that the pain is actually in part due to the ischaemia. For a certain objection which may be raised to this theory that the amblyopia is due to ischaemia,—the objection, namely, that if it were so we would expect to find other signs of cerebral ischaemia such as paralysis of the extremities or of the respiration centre, Loewe is prepared with the reply that the occipital lobes are very poorly (comparatively to the rest of the brain) supplied with blood-vessels, and are therefore more likely to suffer. Should vision not return, that would indicate that the spasm of the vessels had not ceased until so much time had elapsed that a descending degeneration of the conducting apparatus had begun.

In an article dealing with the influence upon vision exercised by lead poisoning, Jean Galezowski has a paragraph upon this transitory amblyopia. According to him it was the first eye symptom of saturnism to be recognised, it having been known since the seventeenth century. The amblyopia comes on while the patient is suffering from colic, and there are usually numerous other indications at the same time—head-ache, giddiness, cramps, mental dulness—in fact, the sufferer is, as a rule, deeply under the influence of the poison. It is most frequent for the actual onset to be at night, but if it should occur through the conscious hours the patient complains of a mist before the eyes, or, more rarely, of photopsiae. The complete loss of sight usually lasts until next day, possibly a little longer even, and is generally quite gone and the patient seeing as well as ever in three days at the outside, and as it passes off so do the other symptoms to which reference has just been made.

Galezowski does not agree with Loewe that ischaemia, even of the cerebrum, is the cause of the amblyopia. After expending some rather unnecessary trouble in pointing out that the condition is not one of hysteria, he draws attention to the

constant absence of permanent damage to other functions which might be expected to suffer from a cerebral ischæmia. He inclines to the view that œdema of the nerve sheath and nerve, which all observers admit to be sometimes present, is the cause of the amblyopia, this itself arising from the high arterial tension. To this œdema then Galezewski attaches great importance, while Loewe, though admitting its existence, regards it as quite a minor change produced secondarily by the contracted state of the arteries.

W. G. S.

A. DARIER (Paris). **Panophthalmitis with Gas-formation caused by Bacillus perfringens.** *La Clinique Ophthalmologique*, xii., 15.

At a meeting of the Paris Ophthalmological Society, a short time ago, Darier described a case of panophthalmitis with formation of gas, which is certainly rare if it be not unique. The patient was a young mechanic, aged 20, whose left eye was struck with a chip of metal on January 31st. The pain was not great at the time, but next day vision was very much reduced, and even so early the patient found the other eye defective. It was at this time he consulted Darier, who found the exterior of the injured eye so normal in appearance that the idea of simulation on the part of the patient actually crossed his mind. There was found, however, a very small wound of conjunctiva, already closed, situated in the lower *cul-de-sac* posterior to the ciliary region: the cornea was intact, the pupil circular, not dilated, and reacting properly to light, no infiltration of the iris, and no circumcorneal injection. Under atropin the pupil dilated freely and evenly; there were no synechiæ and no exudation into the pupil. The fundus appeared normal: there was no affection of macula or disc, no detachment of retina, no hemorrhages. But away towards the equator of the globe, in an upward and outward direction, in the vitreous humor and in front of the retina, was a black mass forming a rectangle with rounded-off angles, and without any metallic lustre. On its surface, however,

were a few minute, highly refracting globules; these certainly consisted of air or gas, and one could perceive by their means the track which the foreign body had traced through the vitreous from the wound of entrance. Naturally, these were taken to be air bells carried in by the piece of metal. Intending to employ the magnet under chloroform the following day (Darier prefers to give a general anæsthetic when the foreign body lies deeply situated), the surgeon ordered atropin, cyanide of mercury, and dionine; but next day, when the patient returned, he was evidently very ill and in intense pain. The eye was red and chemosed, the lids inflamed and swollen, the cornea dull and œdematous, hardly permitting a view of a moderately dilated pupil and a shallow anterior chamber containing no hypopyon. The eye was stony hard.

Under chloroform Darier enlarged the wound of entrance with a Graefe's knife and was astonished to find a frothy fluid, yellowish in colour, escaping when he did so, like champagne from a opened bottle. At the first attempt the electro-magnet removed a fragment of steel, but the whole of the vitreous humour, liquefied and full of gas, escaped. Enucleation was therefore performed, as the eye could not possibly have ever again been of use. The subsequent progress of the case was quite as usual, except that for a few days the patient suffered from very severe headache. Bacteriological examination of specimens from different parts of the eye showed the presence of a bacillus, rather long, with squared-off ends, lying in chains, in certain places,—the same organism which Darier had previously found in a similar case, and which was pronounced by Chaillous to be *bacillus perfringens*. This previous case was recorded some months ago in *La Clinique Ophtalmologique* also, and the clinical history of it was almost exactly similar to this,—a penetrating wound by a foreign body, and rapid suppuration with liquefaction of the vitreous in spite of immediate and energetic treatment.

It seems then that after such an injury a form of panophthalmitis may arise, resisting the most vigorous treatment and destroying the eye with great rapidity.

Chaillous was the first to describe *bacillus perfringens* as occurring in the eye according to Darier, but this organism had previously been detected in cases of post-traumatic gangrene of the leg and of foetid otorrhœa with mastoiditis. The organism is briefly described as a large bacillus,

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about 3 to 9 μ in length by 1 μ in width, found in groups or isolated, intra- and extra-cellular in position; its extremities are sharply squared off. Spores are never found: it colours well with fuchsine and gentian violet, and takes Gram stain well. It is a strictly anaerobic organism.

W. G. S.

P. GIANI (Italian Army). **Dacryo-adenitis from gonorrhœa.**
Rivista Italiana di Ottalmologia, August, 1906.

WE are beginning to understand the nature of gonorrhœa better now than we formerly did, and learning to regard it as a general infective disease with various complications and consequences produced either by the organism whose presence is the actual cause of the disease, or by its toxins; these may remain latent in the body for a very much greater length of time than was at one time believed,—even so long as ten years. Taking an analogy from Fournier's doctrine that certain affections are "parasyphilitic," Giani proposes to employ the term "paragonorrhœal" for certain of the developments. Among such complications one which is very far from being frequent is inflammation of the lacrymal gland. When this occurs while a gonorrhœal ophthalmia is in process, the simple explanation is that it is due to a direct infection from the conjunctiva; but what of the cases in which the conjunctiva apparently contains no bacilli of Neisser, and in which neighbouring parts are all healthy,—showing that the direct continuity theory is plainly at fault? One must fall back upon the hypothesis that the toxins of the gonococcus are able to produce inflammation in some part where for some reason, explained or unexplained, there happens to be a *locus minoris resistentiæ*. The same occurrence may take place in the course of enteric fever, influenza, articular rheumatism, &c. Several writers have touched on this subject, and in particular and recently Casali (Florence) has done so, and has attempted to draw a distinction between those cases in which numerous organs are affected and the microbe has been demonstrated and those in which the manifestation was limited to the lacrymal gland and search for the organism was unsuccessful.

In the latter group the case about to be related would fall to be included. It is that of a junior officer in the School of Musketry, who came to the military surgeon complaining of double dacryo-adenitis. He stated that he was also suffering from gonorrhœa of ten days' duration and that this was undertreatment by internal remedies and injections of protargol. There was a very considerable degree of swelling and redness in and about the two upper lids, with œdema locally and pain radiating through the temple, with loss of appetite and a raised temperature. In the next few days the swelling rather increased, especially at the upper part of the orbit, and there was some impairment of movement of the globe laterally. There was lachrymation and a good deal of catarrhal secretion from the eye, the conjunctiva was red and œdematous, especially at the outer side, the eye could hardly be opened, and the patient had slight photophobia. The point of greatest tenderness was on each side precisely in the region overlying the lacrymal gland, just below the outer end of the eyebrow, which could be felt tense and somewhat swollen by the finger. At the same time fundus and media were quite normal. No visceral lesion could be discovered, the heart and joints being examined with particular care, but with a negative result. Gonococci were found in abundance in the urethral secretion, but repeated examination of the conjunctiva and even of the punctured lacrymal gland gave a negative result.

Apparently the patient was of somewhat neurotic temperament, for in spite of being assured that the malady was not very important and that the swelling would clear up without leaving any trace, he had several convulsive seizures with loss of consciousness, and with some mental dulness remaining afterwards. However, the local condition, under cold compresses, &c., recovered gradually and completely.

It seems probable from analogy, as well as from the negative result of local examination and from the difficulty of imagining the distribution of the actual bacteria by the blood stream, that it is the toxins proceeding from the gonococcus rather than the organism itself which causes such inflammations in other parts, and in particular the nerve phenomena. It has further been shown that inoculation of the cornea with the toxins is capable of causing hypopyon-keratitis, and that subcutaneous injection with sterile pus may cause a urethritis exactly resembling a true gonorrhœa.

Discussing the question whether the condition should be regarded as a metastasis proper or a toxic manifestation, Giani decides that the latter is the true solution, basing his decision upon the facts of this manifestation taking place during the acute affection and of the negative results of culture experiments upon the blood, the secretion and the gland.

W. G. S.

TH. LEBER and A. PILZECKER (Heidelberg). **New Researches on the Fluid Exchange of the Eye.** *v. Graefe's Archiv für Ophthalmologie*, lxi., 1.

IN the present paper the authors have given full details of the experiments on which Prof. Leber's recent statements at the Heidelberg Congress were based. They form a model of careful and accurate work on the subject. The work was largely undertaken to test the accuracy of Uribe y Troncoso's paper in which he alleged that the results obtained by the use of the Leber's well-known double manometer were not to be relied on. [*Ann. d'Ocul.*, cxxxiii., Jan., 1905.] The authors begin their paper with a minute account of the correct method of using the apparatus, and then proceed to discuss the various points that may be found to affect the value of the figures obtained. They come to the following conclusions:—

1. During an injection into the eye at constant pressure the manometer in connection with the apparatus does give practically the same reading as a separate fine manometer in the eye, at the pressure and rate of flow employed.

2. The rate of flow is not affected by the seat of injection: the same figures are obtained by injection into the anterior chamber as into the vitreous.

3. The rate of flow for 1 per cent. NaCl solution is the same as that for aqueous.

4. The effect of temperature is very marked, and is in accordance with Schmidt's work on the effect of temperature on filtration through animal membranes. This effect is therefore a physical and not a vital phenomenon.

5. If the pressure in the eye is altered, the rate of filtration on returning to the former pressure remains altered for a

very considerable period. Runeberg has found a similar state of affairs in the filtration of albuminous fluids through animal membranes. [*Arch. d. Heilk.*, Bd. xviii., 1877.] The authors attribute this phenomenon to the imperfect elasticity of the eye. Comparable results, although of much shorter duration, were obtained in experiments with a thick-walled rubber balloon.

6. If care is taken to ensure that no sudden change of pressure is made in the eye during the experiment, a constant rate of flow is easily obtained. The difficulty in obtaining a constant figure by previous observers is due to the sudden alterations in pressure that have been allowed to occur, bringing into play the imperfect elasticity of the eye.

7. Since the possibility of stretching the globe has been shown to be nearly twice as great as was previously assumed to be the case, it is obvious that the increased rigidity of the globe that may occur in old age can play a considerable part in the pathology of increased intra-ocular tension.

Details of the experiments on which these statements are based would occupy too much space. Every detail has been accurately worked out, and in the light of our present knowledge of the subject there seems little more to be said on this particular method of experiments.

E. E. HENDERSON.

EDWARD JACKSON (Denver) and G. E. DE SCHWEINITZ (Philadelphia). **The Ophthalmic Year Book.** Vol. 3, p. 286. The Herrick Book and Stationery Co., Denver, Colorado.

THE third volume of the Year Book, dealing with the literature of the year 1905, fully sustains the reputation of the previous volumes. It appears in similar guise, and though the number of pages is less than last year, alterations in type have enabled the authors to include a somewhat larger amount of material.

A new feature in this volume, concerning the usefulness of which we have no doubt, "is the mention of some of the best English abstracts of articles, which originally appeared in a foreign language." This will certainly enhance the value of the Year Book to those whose linguistic accomplishments are limited.

We note that the authors have now omitted all prefixes to the names of authors quoted in the text. The mistakes in the letterpress are few, and those we have detected in a prolonged study of the volume are in no sense important. We strongly commend the Year Book to the notice of all English-speaking ophthalmologists.

E. V. HIPPEL (Heidelberg). **Pathological and Anatomical Findings in Rare Retinal Diseases.** *v. Graefe's Archiv*, lxiv., 1.

IN the two cases here given there had been a chronic retinal disease. Sight had been defective since youth. In both cases the choroid was found free from any gross changes.

In the first case, before enucleation the left eye was typically glaucomatous and anaurotic. The right eye was quite normal.

On examination of the left eye the retina was found to be almost completely detached. The retinal vessels were uniformly diseased, presenting hyaline degeneration, enormous thickening of the vessel walls, endarteritis, endophlebitis and proliferation of the adventitia. Everywhere extensive new formation of vessels could be seen. Pronounced proliferation of the connective tissue elements with degeneration of nerve elements. Here and there circumscribed fibrinous deposits, cystic spaces, some empty and some containing pus cells. An irregular thickening of the retina was present.

As regards the origin of the detachment of the retina, none of the sections showed any tugging from the side of the vitreous. Primary inflammatory exudation from the choroid was improbable on account of the healthy condition of this structure. Therefore it is most likely that the cause was in the retina itself, and most probably took its origin in the rigidity and enormous thickening of the vessels, and in the shrinking of the fibrinous exudates and new-formed connective-tissue elements and of the organised hæmorrhages.

The fluid behind the retina was simply transudate and the pus formation was probably due to secondary infection from micro-organisms.

In the second case the process was also chronic. The right eye was amaurotic. In this case the principal features were subretinal, retinal, and vitreous hæmorrhages. Cholesterin crystals and giant-cell formation were seen in places. The organisation of the hæmorrhages began principally from the choroid, but this does not exclude the retina as being the sole source of the hæmorrhage.

Hippel thinks the beginning of the process is disease of the retinal vessels of unknown cause. He cannot say anything with regard to the participation of the pigment epithelium in the process. The subretinal pigment and pigment in the retina was mostly fuchsin crystals. It is improbable that the infiltration of the choroid with lymphocytes means independent choroidal disease, as it only exists when the hæmorrhages are most marked.

H. HORSMAN McNABB.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Meeting held 13th July, 1906.

The President, MR. PRIESTLEY SMITH, in the chair.

Notes of a case of Unilateral White Eyelashes and Tufts of Hair.—

MR. C. H. USHER.

Mr. Usher described the case of a girl, aged 3, with all the eyelashes of the left side white and two tufts of white hair on the left side of the head, all of which abnormalities dated from birth. The points in the history were for the most part negative, the skin was blonde all over the body, the hair generally was of a light brown colour, but there were no trophic changes nor any lesion of the fifth nerve. The irides were light blue but the fundus of both eyes was found to be quite normal, and there was no nystagmus. The family history, which had been most carefully investigated, showed many members having light brown hair and blue irides, but with the exception of a typical albino fundus in the patient's brother, aged 5, no evidence of albinism was discovered in any generation.

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CHOROIDAL HÆMORRHAGE FOLLOWING CATARACT EXTRACTION.

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THOUGH quite a number of cases of this serious complication to cataract extraction are reported, it is fortunately still of rare occurrence.

The first to describe this condition seems to have been Wenzel, in 1779, and since then cases have been reported at varying intervals up to the present date. From these we learn that the hæmorrhage may occur immediately after the corneal section, later before the dressings are applied, some few hours or a day or more after the operation. The occurrence of the hæmorrhage seems to be independent of the method of extraction employed, though Da Gama Pinto and Girard obtained favourable results by performing a preliminary iridectomy.

In consulting the records of the Manchester Royal Eye Hospital for the last twenty years, I find that choroidal hæmorrhage occurred in three cases (including my own case) out of a total of 4,422 extractions. In one of these cases the tension was below normal, and hæmorrhage occurred the night after, and in the other three days after the operation; in neither is there any pathological record.

Case. B.H., age sixty-six, was admitted to the hospital on August 10th, 1902. Right eye aphakia. Left eye mature cataract. Physical examination negative. Urine normal. Two days following admission the left eye was operated on. I attempted to perform a simple extraction

but there was no resilience in the eye. Fluid vitreous escaped after the iridectomy, and the lens, which would not present, was spooned out. The vitreous was cut away with scissors and no attempt made to remove cortex in the pupil. About two hours after the operation the dressings and bandage were soaked with blood, and on removing the dressings there was a large blood clot between the lids. The next day the blood clot was cut away from the bulging corneal wound. A fortnight later the eye was enucleated.

Some time previously I had performed a simple extraction on the right eye with resulting vision = $\frac{6}{6}$ J1. With the exception of some hyphæma a day or two after the operation the right eye recovered normally.

Macroscopic examination. The globe is somewhat distorted. The corneal wound is occupied with hæmorrhagic tissue and covered with epithelium. The interior of the globe is completely filled by a hæmorrhagic extravasation. The choroid is partially detached and the retina nearly wholly so. There is still a small amount of vitreous humour to be seen.

Microscopic examination. The cornea appears clear and healthy as does the sclera. The tissue filling the wound consists of some iris, lens matter and blood cells. No pus formation is evident anywhere. The choroid is in places disorganised by hæmorrhage. The retina appears fairly healthy, but is in parts œdematous. The vessels of the eye show a slight fatty degeneration, but in sections stained for the purpose no amyloid degeneration could be found. Sections stained for iron show an abundance of iron pigment in the choroid. The pigment epithelium shows signs of degeneration.

We may conclude that hæmorrhage from the choroid after extraction is still very rare. In the above statistics

it occurred once in 1,474 cases. If there is choroidal hæmorrhage in one eye it does not follow that the other eye will suffer in like manner. The most frequent cause is probably atheromatous or fatty disease of the vessels and sudden reduction in the tension of the eye following the incision in the cornea and the escape of the aqueous.

In cases where there is increased tension, or in the decrepit, or when there are marked general vascular changes evident, it seems advisable to perform a preliminary iridectomy, or, as some advise, a discission of the senile lens. Where hæmorrhage has occurred, I doubt very much whether the exhibition of ergot, morphine hydrochlorate, etc., will have any great beneficial effect.

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REVIEWS.

SEEFELDER (Leipzig). **Clinical and Anatomical Investigations of Pathology and Treatment of Congenital Hydrophthalmos.** Second part:* Anatomy. *v. Graefe's Archiv für Ophthalmologie.*, lxiii. 3.

DURING the last two years Seefelder had the opportunity of examining seven eyeballs, most of which were immediately after enucleation put into warm Zenker solution to which acetic acid and formol had been added. They were prepared for cutting by the dry celloidin method of Wolfrum and stained by a combination of hæmalum and van Gieson, or Heidenhain—van Gieson. We here give a short pathological resumé of each case:—

CASE I. Leaving out of consideration the changes due to operative interference, there is noticeable a moderate enlargement of the whole eyeball, in consequence of the distension of cornea and sclera; abnormal narrowness and position of the venous canal of Schlemm which is visible in every section; defective development of the scleral spur, and insufficient differentiation of the outer layers of the corneo-scleral trabeculum; florid inflammation of cornea, iris and ciliary body; commencing glaucomatous excavation of the optic disc.

CASE II. and III., both eyes of a little girl 7 days old, were enucleated ten hours after death and hardened in Müller. They were practically alike, and showed a marked uniform enlargement of both eyes due to the distension of cornea and sclera, abnormal development and persistence of the ligamentum pectinatum, partial obliteration of the veins of the canal of Schlemm, foetal formation of the ciliary muscle, remains of a nearly vanished irido-cyclitis with secondary participation of the posterior surface of the cornea, glaucomatous excavation of the optic disc, broadening out of the entrance of the optic nerve.

CASE IV. is the left eye of a boy, 8 years of age. It shows enlargement of the eye from advanced distension mainly of the anterior portion of the eyeball, moderate shrinking of the

* For the review of the first part see *Ophthalmic Review*, August 1906, p. 243.

eye itself, defective development and backward position of the scleral spur, abnormal narrowness and partial obliteration of the venous plexus of Schlemm, partial thickening and laceration of the corneo-scleral trabeculum, chronic irido-cyclitis with formation of exudative membranes, slight atrophy and diffuse inflammation of the choroid with hæmorrhages, funnel-shaped detachment and extensive ruptures of the retina.

CASE V. is also the left eye of a boy, 8 years of age, with the following changes:—Enormous enlargement of the eyeball owing to excessive distension of the cornea and the whole sclera; pigment inclusions in the proliferated hyaloid on the posterior surface of the cornea; constriction and partial obliteration of the venous plexus of Schlemm which has at the same time a slight displacement backwards; thickening of the outer portion of the corneo-scleral trabeculum, partial atrophy of the choroid; total atrophy of the retina; ruptures of the retina; myopic conus and glaucomatous excavation of the disc, and thrombosis of the central retinal vein.

CASE VI. is the right eye of a boy, 8 years of age. The noticeable changes in this case consist of enormous enlargement of the whole eyeball from intense distension of cornea and sclera, a trace of posterior staphyloma, pigment inclusions within the newly-formed hyaloid of the posterior surface of the cornea, rupture of the cornea-scleral trabeculum and of the ciliary muscle, constriction and partial obliteration of the venous plexus of Schlemm, thickening of the outer portion of the trabeculum, disseminate infiltration at the iris angle, circumscribed atrophy of the choroid at the posterior pole, myopic cone, glaucomatous excavation and atrophy of the optic disc.

CASE VII. is an eye enucleated in 1871 and hardened in Müller. No exact data as to its origin could be found. Anatomically it shows a fairly even enlargement of the eyeball due to the distension of its membranes in their entirety, a healed central (internal?) ulcer with traces of a severe irido-cyclitis, total obstruction of the iris angle by a circular peripheral anterior synechia, anterior polar and total cataract, glaucomatous excavation of the optic disc with temporal conus, and thrombus of the central retinal vein.

Besides these seven eyes the author mentions that he has examined four other eyes, but refrains from further detailed description, as no new points were thereby brought to light.

The question whether the ordinary hydrophthalmos and progressive myopia are one and the same disease is then examined. This view which has been held most strongly by Stilling is not corroborated by careful observation of facts. Incompatible with such a view are the striking differences of the build of the anterior part of the eye in excessive myopia on the one hand, and in hydrophthalmus on the other. These are in most cases so pronounced that the differential diagnosis of both diseases can be made at the first glance. Characteristic in the clinical appearance of hydrophthalmos is the indistinctness of the corneo-scleral margin, due to the distension of the limbus, and, further, the enlargement of the cornea. Both these symptoms are absent in the purely myopic eye. The cornea of the myopic eye is not stretched; no symptoms of distension are present, such as ruptures of Descemet's membrane, or flattening of the corneal curvature; nor is this cause of such stretching present, viz., increased intra-ocular tension.

A hydrophthalmic eye cannot be considered myopic—according to Stilling every buphthalmic eye is myopic—when, as in two of the author's cases, hypermetropia could be recognised skiascopically and functionally.

Nor can Stilling's opinion be corroborated that the thinning of the sclera in hydrophthalmos does not approach that of myopia. The results of the author's investigations have, to his mind, proved the very opposite.

Further, the deleterious symptoms of excessive myopia do not appear in hydrophthalmos, and *vice versa*. The hydrophthalmic eye does not become amblyopic from macular changes, but from atrophy of the disc by pressure, and the excessively myopic eye does not as a rule become amblyopic from atrophy of the disc, but on account of the macular changes. The ophthalmoscopic occurrences of myopia, such as hæmorrhages, changes of pigmentation, white atrophic patches, the large posterior staphylomata, etc., are absent in hydrophthalmos. It may also be noted that the region between the insertion of the recti and the limbus is not distended (stretched) in myopia, as opposed to hydrophthalmus.

From these and other observations Seefelder holds the opinion that hydrophthalmos and high myopia are two absolutely different diseases.

With regard to the pathogenesis, Seefelder comes to the following conclusions:—

The cause of congenital hydrophthalmos is not a uniform one. The disease is shown to be, in some cases, due to different primary, congenital errors of the channels of filtration and to disturbed filtration. These changes consist of:—

1. Abnormal persistence of the fetal ligamentum pectinatum.
2. Abnormal (backward) position of the venous circle of Schlemm.
3. Abnormal narrowness of the venous circle of Schlemm.
4. Insufficient differentiation of the corneo-scleral trabeculum.
5. Rudimentary development of the scleral spur.

There may also be a complete or partial absence of the venous circle of Schlemm, as noted by other observers.

Defective development of the channels of filtration forms in most cases the primary cause of pure congenital hydrophthalmos.

Inflammatory processes and vaso-motor disturbances originating by way of the fifth nerve or of the sympathetic nerve are to be considered as secondary causes only as setting the process going.

K. G.

ALBIN DALÉN (Lund). **Pathological Anatomy of Alcohol-Tobacco Amblyopia.** *Mitteilungen aus der Augenklinik des Carolinischen Medico-Chirurgischen Instituts zu Stockholm*, 1906.

DALÉN was fortunate in being able to obtain within a few hours of death the eyes, optic nerves, and tracts of a patient with amblyopia from abuse of alcohol and tobacco, the first symptoms of which appeared nine weeks before his death by suicide. He gives a résumé of the previous work.

The first exact anatomical investigation of a case was that of Samelsohn, which, however, is not of great value, as the patient denied alcohol and tobacco, developed definite signs of disease of the nervous system, and did not die till two years and eight months after the first symptoms of amblyopia. Clinically, in the early stages the patient showed the typical scotomata for red and green. Samelsohn made a careful microscopic examination, but used the older staining methods. He found definite signs of degeneration in the central portions of the orbital optic nerve, and particularly in that part which lay in the optic foramen. The diseased area showed a thickening of

the connective-tissue septa, which encroached upon the enclosed spaces, and atrophy of the nerve fibres. The retina showed thinning of the nerve fibre layer and diminution in the cells of the ganglion layer. Samelsohn considered that the condition found was due to a partial interstitial neuritis and secondary descending atrophy of the optic nerve fibres: in his opinion, the interstitial changes were undoubtedly primary. He compared the condition with cirrhosis of the liver, in which the first change is an interstitial one with parenchymatous changes later.

Nettleship and Edmunds published a case about the same time: the changes found were identical with those of Samelsohn.

In the same year Vossius had a patient who died of "brain disease." Three years previously he had been treated for contral scotomata due to alcoholism. The discs, optic nerves, and tracts were examined microscopically, and showed thickening of septa, multiplication of nuclei, increase in number of vessels and atrophy of nerve bundles.

Bunge published a case of *tabes dorsalis* with optic atrophy in a patient, aged 45. There was a central scotoma for red and green, and pallor of the temporal halves of the discs. The portion of the nerve affected corresponded with the previous cases, but the changes in the tract showed some differences. He ascribed the condition to an essential degeneration of the nerve fibres rather than to an interstitial change. As the nerve fibres of the same group supply the region between the macula and papilla, Bunge designated these fibres the papillo-macular bundle.

Uhthoff investigated anatomically six cases of amblyopia in which undoubtedly alcoholism had been present. The appearances found corresponded closely with those described above. He came to the conclusion that the pathological condition is primarily an interstitial neuritis with secondary atrophy of the nerve fibres. The changes differed markedly from those found in *tabes*, viz., a primary degeneration of the nerve fibres with secondary thickening of the interstitial connective-tissue.

The cases of Thompson, Stoltzing and Baedecker agree with Uhthoff's theories.

S. Sachs now published a case which caused him to take a different view. In an undoubted case of alcohol-tobacco amblyopia, the patient died seven weeks after the commencement of the loss of sight, when Sachs found a few places in the

optic nerve where the connective-tissue was thickened; inside this no nervous elements could be recognised. He concluded that the thickening of the connective-tissue could not be due to interstitial inflammatory hyperplasia, but rather to atrophy of the nerve elements and matting of the supporting tissue in consequence of the atrophy. He considered it undoubtedly to be a partial neuritis, and recognised the possibility that at the height of the disease interstitial changes might also occur.

Later Sachs published another case—a man, aged 19 years, with pulmonary plithisis. Loss of sight one month: large central scotoma for all colours. Alcohol and tobacco denied. Vision gradually returned to normal, and sixteen months after first loss of sight the patient died. Sachs found disease of the papillo-macular bundles, most marked in the posterior orbital portions of the nerve. A few vessels in this region showed peri- and endo-vasculitis, and there were some small hemorrhages. The nerve fibre layer of the retina at the side of the disc was thinned and the ganglion cells diminished in number. As the greatest vascular change was found in the posterior intra-orbital portion of the nerve where the nerve fibres were most diseased, Sachs considered that the change played an important rôle in the disease.

De Schweinitz came to the conclusion that Sachs' theory was the correct one, and that the earliest change in these cases must be sought in the blood-vessels.

Siegrist, in 1900, published a case of a man, aged 55, who a few years before death suffered from loss of sight apparently due to alcoholism. The optic nerves were much shrunken on the temporal sides: the papillo-macular bundles were atrophic, and in close connection with these bundles there was an undoubted thickening of the interstitial connective-tissue with nuclear proliferation. Many new vessels were also seen with sclerosed walls. Widmark's case resembles this.

Birch-Hirschfeld found the ganglion cells throughout the retina degenerated, and considered that a primary atrophy of the ganglion cells was the first and most important change.

Schieck came to the conclusion that an active proliferation of connective-tissue was primary. He found no evidence of strangled nerve fibres, and believed that the vessel changes accounted for the atrophy of the axis cylinders. He could not accept the theory of primary degeneration of ganglion cells with ascending atrophy.

The theories so far enunciated are thus:—

1. Interstitial neuritis localised to a particular part with consecutive ascending and descending atrophy of the nerve fibres (Uthoff).

2. A primary toxic degeneration of the nerve fibres with secondary proliferation of connective-tissue (Birch-Hirschfeld).

3. A primary vascular change with consecutive loss of nutrition and degeneration of the nerve fibres (Sachs, De Schweinitz, Sourdille, Schieck).

4. A primary degeneration of the retinal ganglion cells with secondary ascending atrophy of the papillo-macular bundle (Birch-Hirschfeld).

Older authors had, on theoretical grounds, suggested disease of the macula.

After this résumé Dalén describes his own case. It was that of a man, aged 47, who had complained of loss of sight for three weeks; $V = \frac{5}{50}$. There was a central scotoma for red and green, and fields were full. There was a history of alcohol and snuff-taking. Nine weeks after symptoms first showed themselves the patient committed suicide. The eyes, optic nerves and tracts were removed within a few hours of death and carefully examined. He found by special staining methods signs of degeneration in the retinal ganglion, but came to the conclusion that they were post mortem changes. In the nerve, chiasma, and tracts he found atrophy of nerve fibres corresponding to the position of the papillo-macular bundle, most marked near the globe. The neuroglia was increased, particularly where the atrophy was greatest. The nuclei were not markedly increased in number. The connective-tissue, including the vessels, showed no change. The changes were symmetrical, both in distribution and in intensity. The condition appeared to be a primary atrophy of the nerve fibres with commencing secondary changes in the glial tissue.

Dalén then points out that it is absolutely essential that the case should be a recent one, otherwise it is impossible to distinguish primary from secondary changes. It is rarely that such a case can be found, and in looking up the records only two can be said to be recent, viz., Sachs's first case and Schieck's case. In the former the examination was made seven weeks after the first loss of sight, when degeneration of nerve

fibres were found, but no change in the interstitial connective-tissue. In the latter death occurred nine weeks after the commencement of the amblyopia; there were found marked vessel changes (sclerosis and obliteration), degeneration of nerve fibres, and connective-tissue proliferation,—which last Schieck considered to be secondary.

The author's case shows definitely that marked degeneration of the nerve fibres may be present without the vessels showing the slightest pathological alteration.

Uthoff considers that from a clinical standpoint everything points to an interstitial retro-bulbar neuritis.

Comparisons may be made between the pathological changes in alcohol-tobacco amblyopia and those found in alcoholic peripheral neuritis. In the latter usually only the peripheral nerves are involved, the ganglion cells of the spinal cord not being affected; sometimes degenerative changes are also found in the ganglion cells. The conclusion is that the peripheral changes are not caused by any alteration in the ganglion cells; nor does the peripheral change cause the ganglion cells to degenerate. They are two separate and distinct degenerations due to the same poison. It is possible therefore that the ganglion cells of the retina and the nerve fibres may also be affected independently.

Uthoff, in *Graefe's Saemisch Handbuch*, 1901, defines very precisely the position of the degenerated bundles. The affected area in the anterior portion of the nerve lies as a wedge to the outer side; further back it becomes crescentic, the limbs receding from the periphery till the entrance of the central vessels is reached, when the affected area becomes oval in form with the long axis vertical; this area gradually becomes placed more centrally, and in the post-orbital portion of the nerve is found to be quite central. In the chiasma the degeneration is seen to be symmetrical, becoming more dorsally placed in the tracts. This description almost exactly corresponds with the author's case. He found no evidence of a sudden change at the entrance of the central vessels, as described by Samelsohn. The changes could be traced to the external corpora geniculata, and no further; the ganglion cells in the geniculate body showed no alteration.

The paper is accompanied by some excellent photo-micrographic illustrations and a very complete list of authorities.

E. W. BREWERTON.

TÖDTER (Hamburg). A Case of Paralysis of Movement Upwards and Downwards. *Klinische Monatsblätter für Augenheilkunde*, August, 1906.

THERE is a great contrast between the frequency of interference with lateral movements of the globe and the rarity with which the vertical movements are affected. Theoretically a lesion causing this latter manifestation may be situated cortically (or sub-cortically), in the region of the nuclei, in the hypothetical supra-nuclear centre about the corpora quadrigemina, or peripherally. First, the author, in the discussion of the problem, dismisses those cases in which other movements of the eyes are affected, whether this other symptom is or is not synchronous with the vertical defect, as being due to some affection of the 3rd nucleus. Those cases should also be put into a separate category in which there is congenital defect of upward movement along with ptosis, for the situation of the lesion with them is most frequently peripheral,—in fact, a muscular anomaly in certain instances, though in others the fault is in the nuclei. The particular affection with which Tödter has to deal is sharply to be differentiated from either of these forms.

So far as a cortical lesion is concerned, we are still quite in the dark; there is no case on record of a paralysis of this nature in which a cortical lesions has been proved *post-mortem*: but, judging from analogy, one cannot but suppose that there is a cortical centre for this movement, though experiments on the lower animals have not proved very convincing as to its precise situation. Clinically, it is true, hysterical paralysis of upward and downward movement has been noted, and the same failure after a head injury with concomitant symptoms pointing to a cerebral situation.

To turn to the hypothetical supra-nuclear centre, several authors place this in the corpora quadrigemina, while others deny its existence, and say it is not necessary to postulate any such mechanism at all. If they are correct then it is not to be wondered at that paralysis of these movements occurs so seldom, for the lesion would have to damage the nuclei of the two elevators (or depressors) of each eye. As a rule it is both upward and downward movement which is paralysed; next most frequently paralysis of upward movement alone: paralysis of downward movement alone has not been recorded.

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Clinical observations throw little light on the question of the inter-relations of movements of the globe and the corpora quadrigemina. The symptoms of a lesion affecting the latter are supposed to be cerebral ataxia and paralysis of eye muscles, but even these are not necessarily present, and the case may be indistinguishable from one of cerebellar tumour. When one examines the records of cases of isolated paralysis pursued to *post-mortem* examination it appears that with one exception the cases have all shown a tumour implicating the corpora, or pressure exercised upon its neighbourhood,—especially by the pineal gland. In the exceptional case of Thomsen the region seemed entirely unaffected.

Close examination of the *post-mortem* records shows, however, that much reliance cannot be placed upon the localisation, for it is not possible to exclude pressure effects or “*Fernwirkung*.” Besides that, there are cases also in which there had been no such symptom, although the corpora quadrigemina were quite destroyed by tumour growth. Nor do the results of experiments on animals do much to clear up the difficulty. But, looking at the matter broadly, one is fairly justified clinically in diagnosing the presence of a lesion about the corpora quadrigemina when one meets with an acquired isolated paralysis of upward or downward movement.

In recorded cases the cause has generally been tumour of one kind or another, much more rarely trauma, hæmorrhage or “hysteria”; accompanying symptoms have in some instances been conspicuously absent. A difference may be noted according as the lesion is above the association centre actually or in it. If the former, reflex movements of the globe are not interfered with, though the voluntary movements are lost; if the latter both are alike impossible. Thus in the hysterical cases the patient cannot move his eyes—let us say—downwards, but if one causes him to fix a stationary object and then slowly raises his chin, the eyes will remain fixed upon the object, *i.e.*, the reflex movements are not impeded.

Prognosis varies greatly according to the situation of the lesion, but recovery is very rare, to judge from the literature, for Tödter has only found records of three instances. In one of these trauma was the cause, in the other two there was no certainty as to the origin.

Tödter then proceeds to describe two cases which he had seen at the Breslau clinique. The first was that of a man of 38,

who first complained, in March, 1900, of double vision and giddiness, which continued even when the eyes were shut. At that date he could not, on desire, move the eyes either up or down, but on making him fix an object and tipping back his head a little degree of descent of the glance took place. Both eyes were equally affected, and on attempt to look up nystagmus came on. Lateral movements and convergence were quite good. Vision was normal, so was the pupil reaction. The urine contained sugar. He practically recovered in a few weeks, and three years later was quite well. It seemed probable that the cause was a small hæmorrhage implicating the fibres coming to the corpora quadrigemina rather than the corpora themselves, since there was the decided difference above indicated between the voluntary movement and the reflex.

The second case was that of a man of 24, who at 17 suffered from a heart lesion. In October, 1902, he became suddenly giddy, and began to see double, but had neither headache nor vomiting. The left eye stood somewhat higher than the right; downward movement was almost *nil*, even on vigorous effort; upward movement quite impossible; there was double vision, one image standing above the other. The fundus was quite healthy, and lateral movements were not impeded. Next day diplopia was gone and all movements were quite free. A year later there was again a little diplopia as before, and limitation of both upward and downward movements. The day following the examination the patient died of pulmonary embolism, and the whole of the nuclear region and of the corpora quadrigemina was examined with great care, but no hæmorrhages or other changes of any kind could be discovered. The only suggestion is that of a soft embolus in one of the vessels of the corpora quadrigemina which had rapidly broken up and been carried away, but it would be strange if this had occurred twice and left no trace discernible on microscopic examination.

Tödter concludes his paper with a brief account of the case of an infant of five months with a high degree of ptosis and with complete inability to turn the globes upwards. The child was in every other respect quite healthy. The interesting point is that the father had an exactly similar defect; further back in the family he did not succeed in tracing it.

W. G. S.

TERSON (Toulouse) and A. TERSON (Paris). **Abducent Paralysis in the Course of Otitis.** *Annales d'Oculistique*, July, 1906.

THE appearance of ocular paralysis in the course of otitis media is alarming, and highly suggestive of meningitis or sinus thrombosis. But as an isolated symptom, and even when associated with optic neuritis, its import is not always so serious, and complete recovery may be hoped for. Such a happy issue occurred in cases recorded by Gervais, Keller, Styx, Boerne, Valude and others, and in the two following under the care of the authors:—

CASE I. was that of a girl, *æt.* 12, with no family or personal history suggestive of syphilis or tubercle. She had had no illness apart from *ozæna* and two attacks of right otitis media. During the first attack of otitis she had right facial paralysis, which lasted six weeks. Fifteen months later a second attack was ushered in with symptoms of acute mastoiditis, but operative interference was not required in view of the disappearance of symptoms which occurred along with the onset of *otorrhœa* on the twentieth day. With this, however, right abducent paralysis appeared, though visual acuteness and the appearance of the *fundus oculi* were normal. Under treatment by mercurial inunctions and iodide of potassium the otitis and paralysis improved concurrently, and were cured three months after the first sign of *diplopia*.

CASE II. A boy, *æt.* 7, having no stigmata of hereditary syphilis, but whose father was a general paralytic and syphilitic, suffered from left purulent otitis media, probably of influenzal origin, and left abducent paralysis, which came on about a fortnight after the otitis. There was no affection of the *fundus* or reduction of vision, nor any mastoid symptoms. Treatment consisted in the administration of syrup. iodotannic, and recovery was complete.

The possibility of the paralysis being a mere coincidence is highly improbable, as it always occurs on the same side as the otitis and may be associated with optic neuritis and occasionally with paralysis of the 3rd and 4th nerves. The origin of the paralysis may be infectious or reflex. The nuclei of the 6th, 7th and 8th nerves are closely related functionally and anatomically, and through the carotid plexus the 6th may be reflexly connected with several cranial nerves and in the walls

of the cavernous sinus it receives a direct communication from the ophthalmic division of the 5th nerve and possibly the 3rd nerve.

Such symptoms as blepharo-spasm, nystagmus and spasmodic squint occurring in the course of disease or operative treatment of the ear are often doubtless of reflex origin, but a paralysis coming on some days after the onset of otitis and disappearing concurrently with the latter is much more likely to be of infectious origin. The paths of infection are probably varied. Direct infection would be possible in cases of necrosis or tubercular caries of the petrous temporal at the point where the nerve is in intimate contact with the bone. Infection along the nervous communications of the carotid plexus or localised toxic or necrotic neuritis at a distance from the seat of the disease are all very improbable in the authors' opinion. By far the most likely method of infection is along the venous and lymphatic communications between the carotid canal and its venous plexus and the lymphatic and venous plexus of the tympanum through the carotico-tympanic canals. This communication may become more free owing to the absorption of the bony wall of the carotid canal, thus bringing the carotid sheath and the tympanic mucous membrane into actual contact.

J. JAMESON EVANS.

MAURICE BARGY (French Army). **Two Cases of Ocular Paludism.** *La Clinique Ophthalmologique*, xii., 16, 17.

DR. MAURICE BARGY describes two cases of malarial affections of the eye. These cases are relatively rare in France as in this country; both occurred in soldiers after returning to France from service abroad; one having been a victim of malaria in Madagascar, and the other in the Congo and Tonkin; in both the fever was of the quartan type.

The first case was in a man of 22, and occurred three months after his return home, when nearly two years had elapsed since he had had an attack of fever. It took the form of retinal hæmorrhages with effusion of blood into the vitreous, such as one may meet with in chronic malaria, and which are due to the state of repletion of the ocular venous system.

In the second patient the ocular symptoms were limited to

congestive phenomena of the anterior segment of the eye, and consisted in epiphora, hyperæmia of the palpebral and deep injection of the ocular conjunctiva, hyperæmia of the iris. The patient also complained of a cloud partially obscuring vision, which marked the onset of the attack and disappeared with it in from five to six days. He had three similar attacks at intervals of four weeks; the third attack was treated with quinine and its duration lessened by half. Four months later a superficial ulceration of the cornea of a transient nature appeared, but quickly yielded to treatment.

The author holds that the congestive phenomena of the anterior segment of the eye are of the same nature as those insidious malarial manifestations known under the name of masked fever, especially if one considers their periodicity and their cessation under the influence of quinine.

E. M. LITHGOW.

POSEY and SPILLER. **The Eye and Nervous System: their Diagnostic Relations.** Pp. 988. Philadelphia and London: The J. B. Lippincott Company, 1906.

THIS large work contains twenty-three chapters written by twenty-two authors. The result is a series of articles of a very high order of merit, each bearing the impress of care and thoroughness in its preparation. We have no hesitation in commending the work of each individual author, and in congratulating the editors upon the very valuable collection of papers they have given to the medical world.

When we consider their work as a book destined for a particular purpose and a somewhat limited number of readers, we come to the conclusion that in their editorial capacity Drs. Posey and Spiller have laid themselves open to some adverse criticism. They have, in our opinion, included in the volume articles, and portions of articles, which are rather out of place and the omission of which would have conduced to greater handiness and convenience by materially reducing the size and weight of the book. We do not think that anyone, be he a neurologist or an ophthalmologist, will consult a work professedly dealing with the relations of neurology and ophthalmology in order to learn about the structure and optical

properties of the eye (Chapter 2) or the use of the ophthalmoscope and the appearances of the normal fundus oculi (part of Chapter 8). Again, Chapter 21, on the Surgery of Intracranial Lesions, seems superfluous in a work of this kind. The same remarks apply to portions of several other articles, in which the writers devote considerable space to explanations of terms and description of symptoms with which every neurologist or ophthalmologist is, or ought to be, familiar. The arrangement of subjects also does not seem to us altogether convenient. For instance, the reader who turns to the chapter on Diseases of the Spinal Cord to seek enlightenment upon the ocular signs in locomotor ataxy will be disappointed; the subject is dealt with in an article by another writer under the heading Parasyphilitic Affections.

The articles which appear to us most attractive, in a volume in which all are so good, are in Chapters 1, 3, 5, and 9.

In Chapter 1 Spiller gives a brief but succinct account of the intra-cranial part of the encephalic nerves related to the eye or vision, and the cortical centres of sight, and refers to the most important recent contributions, both clinical and experimental, to the subject. In the section dealing with the oculo-motor nerve he discusses the vexed question of the partitions of the nucleus, showing that considerable diversity of opinion exists as to the exact position of the control of the individual muscles supplied by the third nerve.

Chapter 3, by Mills, on the Psychology of the Visual Act and the Focal Diseases of the Visual Cortex, is, we think, one of the best in the book. It includes the subjects of visual aphasia, mind-blindness, word-blindness and allied disorders, all of which are well and clearly described.

Chapter 5, by Duane, on the Extra-Ocular Muscles, is a learned and very elaborate article, in parts almost too complex for the average reader. Much of its first section on Physiology, Tests and Nomenclature, might have been omitted; in the second section the reader will find a very good account of Paralytic and other Abnormal Conditions of the Extra-Ocular Muscles.

Chapter 9, by Spiller, deals with Tumours and other Lesions of the Brain in relation to the Visual Apparatus and Ocular Nerves, and is a valuable and well-written paper, in which the focal symptoms of tumour of the various parts of the encephalon and their diagnostic value are briefly but clearly

described. The writer does not fully accept the opinion that "unilateral or perponderatingly unilateral optic neuritis is in favour of the tumour being on the same side as the more marked neuritis," as maintained by Marcus Gunn. He is inclined to support the suggestion (made years ago by Edmunds) that the severe character of the optic neuritis met with in cerebellar tumour is possibly due to basal meningitis set up by the tumour.

The book is well got up in every way, and adequately illustrated. It will undoubtedly meet a want, which many who are unfamiliar with other languages than English, have often felt, and will prove an useful addition to the library of all interested in Neurology and Ophthalmology.

W. FRÜCHTE (Erlangen). **Iris Cysts, with Special Reference to Their Treatment.** *Klinische Monatsblätter für Augenheilkunde*, July-August, 1906.

DR. FRÜCHTE describes three cases which came under his observation when he was working in Professor Axenfeld's clinic in Freiburg. In the first two cases the cysts were of the ordinary serous variety, and followed severe perforating wounds of the cornea with involvement of the iris in the scar tissue. The third case was one of pearl cyst, also following an injury. Professor Axenfeld was able to remove this cyst entire, so that opportunity was given for a careful study of its structure.

The treatment adopted in the first two cases was transfixion of the cyst-wall with a Graefe knife. In the first case this operation had to be repeated after five months owing to the cyst having refilled. Examination three years later showed that the cyst had not refilled, while the eye remained quiet and had good vision. In the second case, transfixion of the cyst-wall was performed nine months ago, and the cyst so far shows no signs of refilling.

The pearl cyst (Case iii.) was observed in a boy of 8 years, whose right eye had been severely wounded with a hatchet two years previously. A large irregular corneal scar with incarceration of the iris was present, but the eye was otherwise healthy except for the presence of the cyst ($V = \frac{5}{15}$). The cyst,

which was situated in the upper outer quadrant of the iris, was about the size of a small pea, with characteristic pearly lustre. It was not sharply demarcated from the tissue in which it lay, the iris arching over it in a sort of fold. In order to remove it Professor Axenfeld opened the anterior chamber with a Graefe knife, carefully avoiding injury to the cyst-wall, then freely enlarged the wound with scissors till it involved about half the cornea. This gave free access to the tumour, which he succeeded in removing entire along with the portion of iris adhering to it. A small hole was left in the upper part of the iris, but the sphincter was not interfered with. Quiet healing followed the operation.

Microscopical examination showed the tumour to consist of epithelial cells arranged in lamellæ and showing cornification. At one corner of the cyst the cells appeared cubical or polygonal. The origin of this type of cyst is usually held to be the implantation of epithelial cells into the iris tissue. This explanation Früchte accepts, but he is unable to decide what type of epithelium was present in this case.

Discussing questions of treatment, Früchte expresses the opinion that in the case of serous cysts, and especially in cases where the eye is otherwise healthy, and has good vision, removal of the cyst should not be attempted, but the operation of transfixion with a Graefe knife substituted. In the case of pearl cysts, where this treatment is not likely to be of value, removal of the entire cyst must be attempted. To accomplish this a large corneal section is needed, and Professor Axenfeld's plan of opening the anterior chamber with a knife and then enlarging the wound with scissors appears a good one in cases where it would be difficult to avoid injuring the cyst were the section made in the ordinary way.

In connection with the treatment of serous cysts by puncture, the writer of this abstract might quote the following case:—A man received four years ago a severe ragged wound of the right cornea. The iris was caught in the wound and the lens injured. Healing was slow, but eventually the eye quieted down, and after removal of lens matter and subsequent needling $V = \frac{6}{12}$ (partly) was secured with a correcting lens. The other eye unfortunately was highly hypermetropic and amblyopic ($V = \frac{6}{34}$ with glasses), so that the patient had to depend on the injured eye for reading. Three years after the injury he found the vision deteriorating and the eye occasionally painful,

and on returning to the clinic he was found to have a cyst of the iris, which was causing some irritation, with slight rise of tension. In appearance the cyst closely resembled Case i., described by Früchte. I opened the anterior chamber with a keratome, and attempted to remove the cyst with capsule forceps. A portion of the cyst-wall came away, and as vitreous began to present I desisted from further attempts. The eye remained quiet for a year, when some irritation was again felt, and he again sought advice. The cyst was found refilled, and the eye in practically the same condition as it had been in at the time of the former operation. This time I transfixed the cyst in the way described by Früchte. On puncture a faintly turbid fluid escaped into the anterior chamber. No signs of irritation followed the operation. The cyst remained partially collapsed, and the patient left the hospital in a few days. Even should the condition recur I should be inclined to repeat the operation described rather than attempt complete removal of the cyst, an operation which in this case would probably result in great deterioration of vision if not complete loss of the eye.

J. V. PATERSON.

E. v. HIPPEL (Heidelberg). **Paralysis of Accommodation and Immobile Pupil under Unusual Conditions.** *Klinische Monatsblätter für Augenheilkunde*, July-August, 1906.

WITH paralysis of accommodation after diphtheria we are all familiar, and the same symptom may occur, though with much greater rarity, after other fevers,—*e.g.*, influenza, scarlatina, measles. In some of the cases the condition is really one of general muscular weakness affecting also the ciliary muscle, and the same is true frequently of the so-called paralysis of accommodation after lactation, though v. Hippel does not mention the fact in the article with which we are dealing, but in some of these cases there appears to be a true paralysis; this is specially true of influenza. Besides these there is the paralysis from such toxins as those of (? impure) sausage, fish and shellfish. As a rule in those toxic cases the pupil is dilated, and acts only feebly to light. In diabetes paralysis of accommodation is not uncommon, both with and without dilatation of the pupil.

In Bernheimer's paper (in the *Graefe Saemisch Handbook*), which deals with this subject, he does not, says v. Hippel, discuss the cases of congenital inactivity of the interior muscles of the eye, hereditary and non-hereditary. In syphilis of the nervous system the condition is of course also present, but, curiously enough, occurs very rarely, if ever, in disseminated sclerosis. Cases have been described in which the paralysis appeared to be due to hereditary syphilis; it is of such rare cases that v. Hippel treats in this interesting paper which was read before a Society of Neurologists and Alienists, because he thinks the cases have not received due attention from recent writers.

He relates first an instance in which a young man (20) stated that for a number of years he had seen badly and had been obliged to wear different lenses for distant and for near vision. His hypermetropia (5D with 2 of astigmatism) showed the same degree after as before the use of atropin, and was the same under several tests. His amplitude of accommodation was *nil*. He had had gonorrhœa, but neither syphilis nor diphtheria. There was no fault in his general health save a little anæmia, but it is worthy of note that his father had locomotor ataxia. Here then was a case of paralysis of accommodation lasting for some years at all events, and the only indication of a cause for it was a possibility of hereditary syphilis.

Another case was that of a lad of 15, whose pupils were of moderate size and reacted normally, yet who had absolutely no power of accommodation. Vision was good, the fundus was normal. The patient had never had diphtheria; from his fourth to his eighth year he had had fits at intervals. One year after the first interview he had acquired a low degree of myopia, but accommodation was entirely absent; the same was true four years later; it was then decided by the physician who examined him that he had *petit mal*.

Another case was that of a man of 27, in whom the defect persisted for more than two years. His vision when first seen was (after correction) $\frac{6}{12}$, and two years later was not so good. His amplitude of accommodation was barely 2D. Pupils reacted well; syphilis, alcoholism, diabetes, etc., were not present, but the patient's father was diabetic, and one brother was a hard drinker. This case was complicated by the fact that the patient had for some time been in the constant habit of taking considerable doses of bromide of potassium, to which

perhaps the paresis may be attributable. He had undoubted epileptic attacks; he died with extreme suddenness while conversing with a friend, but unfortunately permission for a *post-mortem* examination could not be obtained.

v. Hippel refers to yet another case, in which a man of 26 suffered from recurring attacks of paralysis of accommodation in one eye or the other or both, along with which there was complete dilatation of the pupil. This had gone on at intervals for at any rate three years. These symptoms strongly suggested the clandestine use of atropin, especially as the patient showed symptoms necessitating confinement as a criminal lunatic, but apparently that was altogether excluded. The condition was attributed to a blow on the skull; the patient's mental condition was very unsatisfactory.

There is no room for doubt that in the cases related the situation of the lesion, whatever be its nature, is nuclear. Some have thought that the dilatation of the pupil might be due to spasm of the dilating fibres, which seems on the face of it improbable, and has as a matter of fact been disproved by the investigation of the action of cocaine and homatropin on such a pupil.

W. G. S.

JAMES THORINGTON (Philadelphia, U.S.). **The Ophthalmoscope and How to Use It.** London: Rebman, Ltd., 1906.

THE author of this book of 300 pages is well known as a writer on matters connected with refraction, and he now has given out a little work concerned with the ophthalmoscope and the fundus, written, as the preface says, "for the student and general practitioner who desires (*sic*) to obtain a working knowledge of the ophthalmoscope with the interpretations of its findings, and has not the time, ordinarily, to study a large text-book on the diseases of the eye, in which the subject is too deeply embedded for immediate comprehension." The author has aimed at being both systematic and practical, and he has to a large extent succeeded.

He begins with the ophthalmoscope itself and the methods of employment of it, then deals with the light, refraction, reflection, and errors of refraction (very briefly). The next chapter is upon the anatomy of the eye; then follow the normal

fundus and then the various pathological conditions of the fundus. He endeavours also to give in outline the symptoms and appropriate treatment in the various diseases dealt with, but in a book of this size, a large part of which is occupied with matters of minor importance,—*e.g.*, verbal description of the ophthalmoscope,—there is really not room properly to overtake treatment and pathology. If space had to be found in the limits of this book for due discussion of pathology and treatment, it would have been better to leave out a good deal of the earlier part and condense the rest of it.

Besides numerous black and white illustrations there are twelve coloured plates of the fundus drawn by Miss Washington, which are all good if rather hard, diagrammatic, and not very well tinted: they illustrate the selected conditions very well, however.

We consider that the book may prove useful to persons of the classes indicated in our quotation from the preface. We notice a number of errors in names, numerous places in which the punctuation is much in need of revision, and not a few examples of sentences which defy parsing. What, for instance, can one make of (p. 48): "Fig. 22, if reversed, shows rays of light diverging from a point and after refraction of the plano convex lens are made parallel"?

What mischievous spirit is it which induces an author to give derivations of words when he does not know them correctly? In several instances Mr. Thorington's Latin and Greek are very much at fault. Rete is the Latin for a net, not "reta," σκοπεῖν is the word, not σχοπεῖν, κατοπτρον not χατοπτρον, χοριοειδής not χοριοειδής; μηνισκος is a Greek word; there is no Latin word "meniscus," though there is "menis," and the Greek means a "crescent or half moon," not a "small moon." The book would have been just as useful even without correct deviations; it is a pity the author has defaced a good piece of work with a needless display of sham eruditions. For one innovation we applaud Mr. Thorington: he boldly writes "minified" as the opposite of "magnified;" it is a word badly needed, which one sometimes has employed when not speaking *ex cathedrâ*; we had not, however, met with it in print before this.

J. TERSON (Toulouse). **Sub-Conjunctival Injections of Sterilised Air in Sclerosing Keratitis of Tuberculous Origin and in Infected Marginal Ulcers of the Cornea.**
La Clinique Ophthalmologie, xii., 16, 17.

IN a recent number we published an abstract of a paper by Dr. Chesneau on a form of sclerosing parenchymatous keratitis probably of tuberculous origin, and of the remarkable results obtained therein by sub-conjunctival injections of sterilised air. Dr. J. Terson also considers such cases to be often of tuberculous or pre-tuberculous origin, and has followed similar treatment with remarkable success both in similar cases and in sclero-episcleritis of rheumatic origin.

Dr. Terson's method of procedure is as follows:—He obtains the air by aspirating it through a thick, closely-packed layer of sterilised cotton wool with an aseptic syringe and injects the air thus obtained under the conjunctiva in the same way as one does in making ordinary sub-conjunctival injections.

The author describes a case of a young man of 20, with sclerosing keratitis of undoubted tuberculous origin, in which, after a series of eight injections made at intervals of eight days, the corneal opacity had receded in a remarkable manner, and the cure was complete.

Dr. Terson also employed air injections with good effect in two cases of infected marginal ulcers of the cornea. In one case the ulcer, which was very painful and complicated with iritis, and had resisted treatment successively with methylene-blue, iodoform ointment, dionine and atropine. The day following the first injection the pain had disappeared; after four injections at intervals of three days the cure was practically complete, then the patient had to return home. After an interval of six weeks a new point of ulceration appeared, and the patient returned for treatment; with two more injections the cure was complete.

In the second case the ulcer had gradually extended almost completely round the cornea, and had resisted ordinary remedies, including sublimate injections of $\frac{1}{10000}$. After the first injection of air the pain was much lessened; photophobia, which was intense, had disappeared; after six injections a cure was effected.

Dr. Terson suggests that the benefits derived from the injections may be due to a diminished supply of the infecting

agents by momentary isolation of the conjunctival circulation from that of the subjacent episcleral tissue or to a salutary revulsive action at the moment of infection. Their method is somewhat difficult to explain, but there seems to be no doubt that by this local method of treatment we may hope to have an efficacious means of arresting the progress of a number of cases of corneal affections of various origins.

E. M. LITHGOW.

FELIX LAGRANGE (Bordeaux). **Combined Iridectomy and Sclerotomy in the Treatment of Chronic Glaucoma.**
Archives d'Ophthalmologie, August, 1906.

THIS operation is described as a new one, the object of which is to produce a permanent permeable or fistulous cicatrix at the irido-corneal angle. The author is dissatisfied with the previous methods designed to attain this end, more especially so in respect to those forms of procedure where a piece of the iris tissue is intentionally left included in the lips of the wound, to become ultimately amalgamated in the cicatrix.

Preliminary to the operation eserine is instilled, and the incision is then made with a linear knife in the scleral tissue impinging over the angle of the anterior chamber. In completing the section the instrument is made to cut its way outwards in a slanting direction inclined backwards, and gradually becoming almost parallel to the surface of the globe, thus giving a tongue-shaped finish to the flap of the denser tissue, beyond which the prolongation of the cutting movement separates a considerable portion of the bulbar conjunctiva. At the next step the whole of this flap is everted downwards on itself over the front of the cornea, so as to throw into prominence the pointed apex of the denser tissue, which is then removed with a pair of curved scissors. Finally, a wide iridectomy is made upwards in the usual manner by two snips of the scissors, one from each side.

Twenty cases altogether had, up to date of writing, been operated upon after the foregoing method; the first one dates from three years ago, two others from eighteen months, and the remainder still more recently. These comparatively short periods afford scarcely sufficient grounds yet for any definite

assertion as to the permanence of the beneficial result of this modification in operation. It is, however, a distinct advance on those other methods for maintaining such a fistulous, or (perhaps more accurately) a cystoid, cicatrix, where the presence in the wound of iris substance or other extraneous material is relied upon to produce the result desired.

KENNETH SCOTT.

MERCK'S (Darmstadt) *Annual Report*.

THIS useful epitome of opinions and experiences in regard to the more recent additions to the drugs in use is dated May, 1906. We are glad to make plain that it does not consist merely of panegyrics on drugs introduced by the firm of Merck, contrary opinions are freely recorded, and the less fortunate experiences of some physicians are detailed as well as the more roscate views of others. Its aim, which is stated to be impartial, is thus fairly attained, and it forms an admirable and handy book of reference, on this occasion reaching 260 pages.

It may be obtained gratis by anyone interested at Messrs. Merck's London address (16, Jewry Street, E.C.).

MIDDLEMORE PRIZE AND HUNGARIAN PRIZE.

THE attention of our readers is drawn to the advertisement inserted in this issue as to the Prize founded by the late Mr. Middlemore. The subject of the Essay on this occasion is to be "Ophthalmia Neonatorum, with especial reference to its Causation and Prevention." Essays in competition for the Prize must be in the hands of the Secretary of the British Medical Association not later than 30th April, 1907, and the award will be announced at the Annual Meeting in Exeter in July, 1907.

We also direct attention to the fact that the Home Secretary of Hungary offers a prize of 1,000 krone for the best work on the Etiology of Trachoma. Essays must reach Belügyminis-

terium, Budapest, not later than 31st December, 1908. An essay may be in print provided it has not been published prior to 1907. The award will be made at the International Medical Congress in Budapest in September, 1909. Essays may be written in French, German, Hungarian, or English.

CLINICAL NOTES.

THE TREATMENT OF ATROPHY OF THE OPTIC NERVE.—Dr. C. Stedman Bull has treated, in his private practice, twenty-five cases of “progressive atrophy of the optic nerve due to acquired syphilis,” by sub-conjunctival and intra-vaginal injections of sublimate of mercury. All were examples of simple atrophy, with no sign of previous neuritis, and all had had anti-syphilitic treatment. There was no evidence of tabes or disseminated sclerosis in any of the patients. The shortest interval between the initial lesion and failure of vision was two years, the longest twenty-three years. The cases were very carefully examined by Dr. Bull as to acuity and field of vision. He gives his conclusions under four headings, of which the following is the most important and well worth recording:—“This method of treatment of atrophy of the optic nerve has, in my hands, proved of no more value than the usual routine treatment by mercury, iodide of potassium and strychnia, and offers no encouragement for its continued use.”—*Journal of the American Medical Association*, September 15, 1906.

A NEW EYE SYMPTOM IN EXOPHTHALMIC GOITRE.—Gifford (Omaha) draws attention to a symptom which has not previously been described, namely, that it is well-nigh impossible in the subjects of Graves' disease to evert the upper eyelid, and when this is accomplished the tension is so great that the conjunctiva of the lid is completely blanched. This symptom has not been present to anything like the same degree in such cases of exophthalmos from other causes as he has had the opportunity of studying since this point first came under his notice. He attributes the difficulty to constant stimulation of the elevator fibres of Müller's muscle, and notes that while present in the early stages of the disease it is not by any means constant in the fully-developed malady.—*Ophthalmic Record*, June, 1906.

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OBSTRUCTION OF THE CENTRAL RETINAL VEIN.

(Abstract of paper read before the Ophthalmology Section of the
British Medical Association, Toronto, August 21st, 1906.)

By F. H. VERHOEFF, A.M., M.D.
(Boston, U.S.)

THE ophthalmoscopic picture of thrombosis of the central vein has generally been regarded as definite and characteristic. Yet in a large proportion of the cases examined anatomically in which this diagnosis has been made, the central vein has been found patent and comparatively normal, while in some of the cases it is probable that a coagulum due to the fixing agent or the appearance produced by a longitudinal section of the vein wall has been mistaken for an obstruction. In fact, previous to the recent publication of Harms, obstruction of the vein had been conclusively demonstrated in no more than six cases, in each of which it was attributed to thrombosis. Of the eight cases of Harms the obstruction was described as due wholly or in part to thrombosis in six. The infrequency with which obstruction of the central vein has been demonstrated, however, is not necessarily an indication that the condition is excessively rare. More probably it is chiefly an indication of the infrequency with which the optic nerve is examined in serial cross sections.

An analysis of the reported cases goes to show that the obstruction in the vein was certainly due to thrombosis in only two cases, in each of which it occurred as the result of sepsis. In the other cases the histological evidence was not only insufficient to show that it was due to thrombosis, but indicated that it was due to endophlebitis proliferans. The obstructing mass consisted either entirely of connective tissue or partly of proliferated endothelial cells, and

contained no remains of degenerated blood, such as blood pigment, while the adventitia of the vein around the obstruction showed no undue vascularisation or other signs of inflammatory reaction.

The writer has examined, by means of serial cross sections, six cases of obstruction of the central vein. With the cases from the literature, excluding the two cases of septic thrombosis, these make a total of eighteen cases from which deductions may be drawn. Of the patients, six were female. With the exception of Harms' Case ix., aged 20, in whom glaucoma was perhaps the primary factor, the ages were between 48 and 70 years. The average age was 58 years. Albuminuria was present in three cases, absent in eight, and not noted in seven. In five cases there were definite signs of general arterio-sclerosis. No mention was made of syphilis or alcoholism as etiological factors, and it seems safe to conclude that the chief etiological factor was senility. Few cases were followed sufficiently long to afford any data as to prognosis in regard to life, but the presumption is that this must be unfavourable. In two cases the eye was obtained at autopsy, and in two others death occurred within three years after the enucleation. One patient was alive at the end of five years. Another was alive at the end of eight years, but during that time had several severe apoplectic attacks as well as an attack of hæmorrhagic retinitis in the other eye. In all except one case the obstruction was situated either entirely within or more often behind and partly within the lamina cribrosa. This is perhaps accounted for by the fact that here the nerve, and with it the vein, is necessarily subjected to its greatest strain during the ocular movements. This might act as a stimulus sufficient to cause proliferation of an intima already on the point of senile hyperplasia.

An interesting question is the relation of obstruction of the central vein to glaucoma. In v. Michel's case

glaucoma did not ensue even after sixteen months' observation, to which fact is evidently due the error handed down in the text-books that obstruction of the central vein does not give rise to glaucoma. As a matter of fact, with the exception of one other case in which death shortly occurred, glaucoma was present in all of the cases examined anatomically. But, as Ischreyt has pointed out, the frequency with which it occurs in such cases may be misleading from the fact that as a rule only those cases in which glaucoma ensues come to enucleation. More important than the frequency of the glaucoma in these cases is the fact that in all but one of them it was monocular. The conclusion from this would seem to be almost inevitable that the obstruction in the vein was the cause of the glaucoma in most of them. Moreover, the writer's first case showed conclusively that acute glaucoma may be due to this cause. On the other hand, the fact that in many of the cases acute symptoms did not occur until the glaucoma had reached an advanced stage, as evidenced by deep cupping of the optic nerve, would seem to indicate that in some cases the obstruction was secondary to or independent of the glaucoma. Further observations are necessary, however, before the question of the relation of chronic glaucoma to obstruction of the central vein can be fully answered.

The clinical features of the writer's first case were briefly as follows:—When first seen the patient stated that the sight of the left eye had been blurred for a week. Ophthalmoscopic examination showed the typical picture of thrombosis of the central vein. The tension was normal, and there was no pain. Vision was reduced to light perception. Thirteen days later the eye became very painful, was stony hard, and showed the appearances characteristic of acute congestive glaucoma. Iridectomy was performed without benefit, and enucleation was carried out for the relief of pain six days after the onset of glaucoma.

The anatomical examination of this case showed that the pathological changes were much more recent than in any other case yet reported. The central vein was found completely occluded, but not by a thrombus. The obstruction was due entirely to obliterating endophlebitis, and not even in part to thrombosis. Behind the obstruction the vein was still completely collapsed, conclusive evidence alone that the condition was of recent date. The optic disc was not cupped, and showed no papillitis. The retina showed numerous hæmorrhages and marked œdema, but was otherwise practically normal. The glaucoma was no doubt due to the excess of albumin in the vitreous humor derived from the retinal veins and capillaries. That the vitreous humor was loaded with albumin was shown by the fact that it was found coagulated by the action of the formaline when the eye was opened.

The other cases of the writer were cases of advanced glaucoma with more or less indefinite clinical histories, in which the relation of the obstruction in the central vein to the glaucoma was not clear. The obstruction in each was due partly to sub-endothelial proliferation of the intima and partly to endothelial proliferation into the lumen. One case was of especial interest, because it showed a condition that heretofore has been regarded as due to canalisation of a thrombus. A few sections behind the main obstruction, the lumen became of almost normal size, but was subdivided by septa into three separate compartments lined with endothelium and filled with blood. The complete set of serial sections showed that the condition was due to undermining of the degenerated intima by the blood-stream from a small collateral. Instead of separating the intima all around, this caused it to bulge out in two places only, due no doubt to the fact that it was more loosely attached here. The new lumina thus formed became lined by endothelium, probably by extension from the collateral and through breaks in their walls.

CONCLUSIONS.

Complete obstruction of the central retinal vein, with the classical ophthalmoscopic picture of thrombosis of this vessel, may be produced by endophlebitis proliferans without thrombosis. The proliferation may involve the sub-endothelial tissue alone, or the obstruction may be completed by a more active endothelial proliferation into the lumen.

All of the cases anatomically examined in which obstruction of the central retinal vein has been attributed to non-septic thrombosis, can be explained by, and in all probability were due to, endophlebitis proliferans alone.

The so-called canalised thrombus of the central retinal vein is in the nature of a dissecting aneurism.

In certain cases obstruction of the central retinal vein may early give rise to acute glaucoma.

A SQUINT MEMORIZER.

By A. LEWIS McMILLAN, M.D., Glasgow.

THE following diagram is suggested as a useful method of remembering the position of the false image in various forms of diplopia, and is suitable for either the patient's or the observer's field.

Facing the patient, I. stands for the patient's right eye, and II. for the patient's left eye. Facing away from the patient I. then becomes the observer's left eye, and II. the observer's right eye. The vertical lines indicate the true images, and the others represent the false images. You have to decide:—

(1) To which eye does the false image belong?

(2) Is it homonymous or crossed?

(3) The diagram indicates by the position of the false image the muscle affected, and also the direction in which the eye would be rotated by that muscle were it not paralysed.

External rectus rotates eye out=false image out.

Internal rectus rotates eye in=false image in.

Superior rectus rotates eye up and in=false image up and in.

Inferior rectus rotates eye down and in=false image down and in.

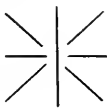


Superior oblique rotates eye down and out=false image down and out.

Inferior oblique rotates eye up and out=false image, up and out.

The diagram seems to me to be simpler than Werner's diamond and cross as figured in Swanzy's book on "Diseases of the Eye." It takes both eyes in the view for comparison, and covers all the muscles involved in diplopia.

I have ventured to call the scheme the Union Jack of squints, and trust that it may prove useful for teaching purposes.

Homonymous.

Inf. ob. 
Ext. rect. 
Sup. ob. 

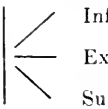
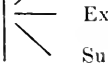

Crossed.

Sup. rect.
Int. rect.
Inf. rect.

Crossed.

Sup. rect.
Int. rect.
Inf. rect.

Homonymous.

Inf. ob. 
Ext. rect. 
Sup. ob. 

LINDENMEYER. **Retro-bulbar Neuritis after Burn of the Skin.***Klinische Monatsblätter für Augenheilkunde*, June, 1906.

MOOREN, more than twenty years ago, in his work on the relation between eye affections and diseases of the skin, described a case in which superficial burning of the skin was followed by double neuro-retinitis. He gave great attention to the subject, and was inclined to think that similar cases were not very uncommon. Certainly however, very few have been recorded. The majority have been of the character of hæmorrhagic retinitis; and the present case, though no doubt properly described by its reporter as one of retro-bulbar neuritis, differed a little from the type of that affection in showing more than usual involvement of the head of the nerve and adjacent retina, with a certain amount of hæmorrhage. The account of the case is as follows:—

A young and healthy labouring man was burnt (by the explosion of a benzine lamp) on the backs of the hands, lower two-thirds of the forearms, and on the face. The burns were of the first and second degrees. He was treated as an in-patient in a hospital, where healing of the wounds ran a perfectly normal course. There was a moderate rise of temperature during the first week, but no cerebral symptoms, no albumen in the urine, no blood in the stools, and, in short, the general condition remained good throughout. The burns were dressed at first with bismuth, later with boric ointment.

Between two and three weeks after the accident he complained of pain in the eyes, especially on moving them, and a few days later noticed dimness of vision; this increased, until six weeks after the accident he could only distinguish large objects.

Lindenmeyer first saw him seven weeks after the burn. The vision was then = fingers at 1 metre with each eye. The optic discs were hazy, the temporal halves of them slightly pale; the vessels were of normal size; several striate hæmorrhages radiated from the right disc and there was one on the margin of the left. There was an absolute central scotoma, but no peripheral contraction of the fields. In the course of the next few days the hæmorrhages had become absorbed, and the pallor of the discs had slightly increased, especially of the left. He was treated by sweating, iodide of potassium in large doses, and sub-conjunctival injections of salt solution, but after a month there was very little improvement in vision.

In Mooren's cases recovery was the rule, and a lasting defect of vision exceptional; but, as has been already noted, the lesions in these cases were mainly retinal, and the optic nerves were comparatively slightly affected. In most of the recorded cases the area of skin burnt seems to have been of moderate extent; we must remember, however, that when a large area is affected, when, for example, it approaches half the total surface of the body, death in a few days is the usual result, so that the eye affection would not have time to develop. The exact cause of death in these cases of burning of the skin has been the subject of much discussion; this case evidently lends support to the idea that it is due to a development of toxins. The experimental work of Wiedenfeld, in 1902, who placed pieces of burnt skin in the peritoneal cavity of animals, and found that peritonitis and death invariably followed, would point to a generation of poisonous substance in the tissue of the skin itself.

But if toxins are constantly produced by burning, and are capable of affecting the optic nerves, why are cases like Lindenmeyer's so rare? We can only point out the analogous case of typhoid and other specific fevers, where in perhaps twenty thousand cases no affection of the eyes is present, and yet in one case, to all appearance similar, well-marked optic neuritis occurs.

W. G. L.

VICTOR REIS. **The Theory of Immunity in Ophthalmology.**
Wiener klinische Wochenschrift, xix., 29.

THIS is a long and admirably-written paper, in which the principles of research in the pathogenesis and therapy of a number of little-understood eye conditions, and the value of these researches, are shown in the improved methods of treatment that have resulted from them.

Experiments with *jequiritol*, for example, as to the action of abrin and anti-abrin have made clear the precedence of local immunity over general; the antitoxin is produced in part by the conjunctiva reacting to the abrin-toxin, and in part through that portion of the poison which is absorbed.

The treatment of *Septic Corneal Ulcer* has been much advanced by the efforts towards artificially acquired immunity against pneumococcal infection. Active immunisation against this infection gave positive results in pneumonia as long ago

as 1892, but Römer was the first to begin investigations as to the influence of artificial immunisation upon the course of *ulcus serpens corneæ*, which in 95 per cent. of the cases has a pure pneumococcal infection. He tried, by introducing a polyvalent serum, to produce similar conditions to those naturally present when spontaneous healing of an *ulcus serpens* occurs. Such conditions may be brought about either by the production of antitoxins (as in diphtheria), or by the production of specific bacteriolysins (as in pneumonia). Römer's attempts in the direction of passive immunisation, by using subcutaneous injections of pneumococcal serum, gave results which were for the most part unfavourable. His experiments, however, with dead pneumococcal cultures proved not only the harmlessness of active immunisation, but showed also that within a few days a favourable influence was exerted upon the ulcer. The conclusion he came to therefore was that active immunisation in combination with passive immunisation should be the specific method of treatment in *ulcus serpens corneæ*. In applying this treatment the active should precede the passive immunisation; and as intra-muscular injections produce their effects the most quickly, the pneumococcal cultures should be injected intra-muscularly, and the serum subcutaneously,—a proceeding which can be carried out in two sittings.

The treatment of *Vitreous Haemorrhage* is another condition which has been brightened in outlook by experiment. Vitreous bleeding, artificially produced in rabbits, has been caused to disappear by hæmolytic serum (Römer); but the only experiment so far made on man (by Elschnig) led to severe inflammation of the globe.

Another question awaiting solution is the prevention or checking of *Senile Cataract*. Though about sixty cases of spontaneous cure have been reported, they were such as were associated with disturbed nutrition due to acute inflammation, or were cataracts complicated with disease of the choroid which had become checked (Hess). The lens epithelium and fibres have been shown to be susceptible to the action of cyto-toxins; and, with the degenerative changes that occur in the organism with age, substances injurious to the lens cells appear in the blood (Ehrlich and Morgenroth). Reis therefore repeats the saying that "the secret of senile cataract is in the senile serum." He discusses in detail the method of attack and protection, but admits that we are still ignorant of the satisfactory application of these observations to treatment.

Römer's view as to *Sympathetic Ophthalmia*, supported by his experiments with non-pathogenic hay-bacilli, viz., that it is a metastasis, and not the result of a reflex influence by way of the ciliary nerves, gets further support in the paper, and Reis argues for the theory that the general circulation, rather than the roots of the optic nerve, is the path by which the inflammation is set up in the sympathising eye.

Finally, the author considers the *Biological Characters of the Pigment-epithelium and of the Retina*. He points to the light that has been thrown on the subjects by experiments which prove that these elements contain groups which neutralise the activity of hæmolysins, and claims that to the vessels of the chorio-capillaris must be ascribed a protective influence for the perceptive elements of the retina against toxic substances.

Reis is to be congratulated upon an admirable presentation of what has been done recently in these several directions, and as the paper is written in excellent German it will well repay careful perusal in the original.

D. MATHESON MACKAY.

SIDLER-HUGUENIN (Zurich). **The Late Results of the Operation for High Myopia.** *Correspondenz-Blatt für Schweizer Aerzte*, June, 1906.

DURING the past few years many papers, of variable value, have been published which deal with this subject, and, although the number of cases recorded is still too small to admit of dogmatic conclusions, the lessons of experience which time brings have considerably subdued the early, and rather hasty, enthusiasm that followed Fukala's first writings.

The conclusions arrived at by Sidler-Huguenin are based on the small number of 75 eyes, but they are drawn from careful examinations made from 2 to 12 years after operation, and collated, in some particulars, with the collected statistics of numerous other writers. They therefore deserve consideration.

As has been pointed out over and over again, the important questions to be answered are three in number, viz., (1) does removal of the lens permanently improve visual acuteness; (2) does it arrest the progress of the myopia with its attendant fundus changes; and (3) does it increase or diminish the liability to detachment of the retina?

With regard to visual acuteness, two sets of figures may be given (these deal only with the 75 eyes examined by the author): (a) comparing the vision before operation with the final (late) result, it was unchanged in two eyes, had improved in 57 (*i.e.*, 76 per cent.), and deteriorated in 16; (b) comparing the vision shortly after operation with the final results, there was no change in 29, improvement in 16, and *deterioration in 30 eyes* (*i.e.*, 40 per cent.).

The influence of operation on the liability to detachments of the retina is a most important and a difficult point to settle. The percentages of "spontaneous" detachments in myopic eyes given by various writers on the subject vary greatly, mainly because the minimum amount of myopia considered admissible by each compiler has varied. One writer will include every case with 8 dioptries or over, while the minimum of another analyst may be 16 dioptries.

Analysing his own cases and averaging the figures given by a considerable number of observers, Sidler-Huguenin concludes that detachments of the retina occurs in 3 per cent. of highly myopic eyes. Collating his own 75 cases with an analysis of 1,749 published operation cases, he finds that the operation probably increases the liability to detachment to the extent of 1 per cent. It is noteworthy that while in his 75 operated eyes detachment occurred in five (in three shortly after operation, and in two after the lapse of some years); in the 57 unoperated eyes there was not a single instance of detachment.

Judging from his own 75 cases, Sidler-Huguenin finds that macular disease occurred twice, and retinal hæmorrhages no less than four times as often in the operated than in the non-operated eyes. He further calculates that there is a loss of 1.166 per cent. from infection, and of 0.69 per cent. from glaucoma. The total loss therefore from infection, glaucoma, detachment and destruction of central vision by macular disease and retinal hæmorrhage, he thinks, amounts to 5 per cent., and is probably above this figure.

The main conclusions arrived at are that the operation cannot be considered a preventive of the increase of myopia, or of its many deleterious complications. The author agrees with most careful ophthalmic surgeons that the operation should be limited to those patients whose sight can no longer be made sufficient for their requirements by optical correction. He himself will not operate for a myopia of less than 22 dioptries;

he advises against operating on both eyes; and he is equally opposed to operation on one eye if there is detachment or central loss of sight in its fellow.

Finally, he quite rightly points out that this operation is a serious one, which stands on a very different footing from, say, that for senile cataract. He considers therefore that a surgeon should explain the risks of the operation to the patient, and impress on him that the well-known precautions and restraints in using the eyes must be observed just as carefully after as before an operation which in no way diminishes their vulnerability.

WALTER W. SINCLAIR.

P. HOUDART (Brest). **Expulsive Hamorrhage and Spontaneous Rupture of the Cornea.** *Recueil d'Ophthalmologie*, July, 1906.

HOUDART comments on the rarity of true spontaneous rupture of the cornea produced by increased pressure within the globe by hæmorrhage. By spontaneous rupture he means the rupture of a cornea which has not previously been the subject of ulceration, injury or purposeful wound, as in operation.

He gives an extensive and detailed critique of cases published which he believes to comply with this definition, particularly of cases published by Job Baster in 1770, by Fleming in 1858 (described by Mackenzie in his text-book), Kyll in 1834, Gilfillan in 1902, Terson in 1900. He believes that the diagnosis of spontaneous rupture in these cases was true.

The general conditions associated with the accident are great age, arterio-sclerosis, over-ripe cataract, weakening of the zonule of Zinn and displacement of the cataract, increase of tension of the eye, and a general thinning of the tissues of the eye—progressive senile decay. In fact just those conditions which make the surgeon fear the probability of dangerous results from operations for cataract extractions.

He then describes some experiments he has made upon fresh pigs' eyes both *in situ* and after removal from the head, with a view to determine the point at which the eye is most prone to burst when an increase of pressure is artificially obtained by injecting water from a syringe.

He found that a comparatively small injection and pressure—1 kilogramme of water for the space of one minute after

1.5 grammes of water had been forced into the globe—resulted in rupture of the globe and always at the equator about some perforation of the sclera for a vortical vein.

In some experiments he thinned down the cornea by shaving off its surface layers, in others he ruptured Descemet's membrane, and in yet others he ruptured the zonule of Zinn, but the globe always burst at the equator.

He proposes to extend these experiments to human eyes, particularly to those from old and infirm persons. It will be of interest to hear his results.

N. BISHOP HARMAN.

C. GOLESCEANO (C.). **Kerato-Conjunctival Dialysis.** *Recueil d'Ophthalmologie*, August, 1906.

GOLESCEANO believes that if it be true that sub-conjunctival injections are of genuine service in eye affections, we are far from understanding the chemico-physiological phenomena underlying such action; for dialyses resulting from such modes of treatment are no way conformable to the evidence that can be obtained.

Bono and Fuchs have attributed tubercle of the iris to the absorption of toxins from the healthy conjunctival mucosa, and the same exogenous origin for iritis and irido-cyclitis following foetid rhinitis has been invoked by François, Sem and Spreng. Despite the distinction of these clinicians Golesceano can scarcely credit such a pathological process, believing the connection to be by lymph and vascular paths rather than dialysis.

After detailing some experimental observations by Koster, Morgano, Leber and Nuel, he gives the results of his own experiments:—

A solution of atropine coloured with fluoresceine was instilled into the eye of a rabbit. After obtaining a maximum dilatation of the pupil, the eye was cocainized and the aqueous humour withdrawn; the fluid was treated with potash to intensify any colour present, but the fluid was found to be as limpid as if from a mountain rill. A sub-conjunctival injection of a solution of methylene blue was made on to the limbus of the other eye, with a result that though the œdema was intense, the aqueous was found on examination, two hours after the injection, to be quite clear.

Yet again, to intensify the fluid changes in the region of the

anterior chamber he followed the suggestion of Heistrath by tapping the chamber prior to his sub-conjunctival injection of coloured fluid, but the aqueous remained unaffected.

If, he says, we are to suppose some selective action on the part of miotics and mydriatics by virtue of their alkaloidal properties, it is certain the cornea forms an impassable barrier for coloured substances; and he asks,—Does the same hold good for salts of mercury? To determine this he extracted the aqueous after a sub-conjunctival injection of a solution of sublimate of 1 in 3,000, and no trace of mercury could be obtained.

On the variation of the albuminous constituents of the aqueous following the instillation of pilocarpine and atropine, as demonstrated by Tornabene, and later Angelucci, he made some experiments; and found that subsequent to the use of eserine he obtained a light cloud-like albuminous reaction with Spiegler's reagent, and an intense reaction after using atropine.

He concludes that, admitting that changes occur in the albuminous constituents of the aqueous subsequent to the instillation of mydriatics and miotics, there is yet no proof of a dialysis of mercury salts; and that any therapeutic value attached to such usage may lie rather in the wish than in a fact, and that the matter is altogether too complex to be settled by experiments *in vitro*.

N. BISHOP HARMAN.

DE MICAS (Toulouse). **The Eye in Death.** *Recueil d'Ophthalmologie*, August, 1906.

THE author discusses the value of the varying conditions of the eye in and after death as certain signs of death, and, further, the varied state of the eye in death from special causes, in particular diseases, or from violence.

Loss of sensibility of the conjunctiva, especially in the limbic region, is of great value, but loses value in cases of death in local or general anaesthesia.

The condition of the pupil, its early dilatation after death and its almost immediate loss of sensibility to light or to mydriatics or miotics, is important; but, again, the initial dilatation passes off in a few hours and may be missed, and it is liable to be varied in cases of disease, such as iritis, cerebral conditions, or poisoning.

The loss of irritability of the iris is of great importance, though the reaction to light has been observed to persist for a time in death from cholera.

Bouchat proposed to utilise the loss of reaction to drugs as signs of death, but it is known that in life some irides will not react to atropine or eserine.

Ophthalmoscopic examination is only possible within a few hours after death, for the cornea speedily loses its transparency. Bouchat first drew attention to the signs to be noted in the fundus; the inability any longer to distinguish the disc, the empty state of arteries and veins and the dull-grey colour of the choroid.

The changes in the cornea are marked, the transparency is lost, the structure becomes glairy, rumpled, flaccid and soft. These signs are absolutely certain, yet they have been found to be delayed in cases of drowning.

There is, further, a change in the colour of the sclerotic through yellowish tints, slate-blue to blackish, or, as Gommer called it, *livor scleroticæ nigrescens*.

Louis has well said: When the globe preserves its natural firmness it cannot be certain death has occurred, whatever other signs of death there may be.

De Micas next considers any peculiar states of the eye to be observed in death in special disease or from peculiar causes. And of these the conditions found after death from violence would be of much interest. Numerous observations have been made upon animals slaughtered for food, particularly as to the state of the eyelids—whether closed, open or partly open. The observations tend to show that the idea that in death from violence the eyelids are generally open is a true one; there are, of course, many exceptions, notably among pigs.

In a concluding section entitled "*Œil Accusateur*," he deals with the conception of authors of popular romances, who revel in a maze of criminal and medical details, that the photograph of the villain is discovered imprinted upon the eye of the victim, when in truth it only exists in the heated imagination of the fluent scribe.

The paper is well worth the examination of those interested in medical jurisprudence, and such emphatic signs of death as those that can be seen in the eye are worthy of a more prominent place in text-books than now obtains.

N. BISHOP HARMAN.

E. V. HIPPEL (Heidelberg). **Spontaneous Hole Formation at the Fovea Centralis.** *v. Graefe's Archiv*, lxiv., 1.

IN this case there was no history of accident, otherwise it is similar to that reported by Fuchs. At the margin of the fovea the inner nuclear and ganglion cell layers are of normal thickness. In the inner nuclear layer and the layer of cone-fibres the retinal elements are separated by hollow spaces filled with fluid which has run in process of hardening in a honeycomb-like manner. The inner nuclear layer is split into two sheaths. In front there is a large space filled with fluid separated from the vitreous by the limitans interna, while at the back there is a thin layer of retina which consists exclusively of proliferated supporting tissue with single pigmented cells. The cones are missing at this place and only appear again at the edge of the fovea. The pigment epithelium is separated by flat degenerated retinal tissue. Torn ends of retinal tissue protrude into the hollow spaces, and Hippel considers this to be artificially produced and of no importance. The vessels show thickening of the walls with hyaline degeneration and narrowing of the lumen. Bruch's membrane is markedly thickened. The choroid is normal, except at the fovea, where it shows hyaline degeneration. There is œdema of the retina with a hole at the centre filled with fluid. This œdema is not due to trauma but to disease of the retinal vessels.

H. HORSMAN McNABB.

KARL MÜNCH (Halle). **The Mechanism of the Movements of the Iris.** *Gräfe's Archiv für Ophthalmologie*, lxiv., 2.

IN former papers published in *Zeitschrift für Augenheilkunde*, 1904 and 1905, the author recorded his views upon the subject of dilatation of the pupil, and stated as his opinion that the stroma-cells of the iris possessed contractile power comparable to that of unstriped muscle.

In this present communication Münch pursues the subject further, and undertakes to show in what manner various knotty points in connection with the subject of iris movements can be explained much more satisfactorily in the light of his theory than in that of any other. Nine "dark points" are thus illumined, and as each is discussed in considerable detail, it is

manifestly impossible to follow the writer at all closely. Such subjects as "the behaviour of the pupil after death," the "physiological ectropion of the iris," the "contraction furrows," the "difference in rapidity of dilatation and contraction of the pupil" may be mentioned in order to give some idea of the scope of the article. The question of the movements of the pillars of the iris in cases where an iridectomy has been performed resulting in a "keyhole" pupil is brought up, but is not conclusively discussed.

The author seeks information regarding the presence in the cephalopod eye of ectropion of the iris, and we are glad to be able to tell him that this type of eye is no exception to the rule, and that ectropion is, in some degree, present. The paper is well written, and merits the careful perusal of all who take special interest in the anatomy and physiology of the iris.

LESLIE BUCHANAN.

CHARLES H. MAY and CLAUD WORTH. **A Manual of Diseases of the Eye.** London: Baillièrè, Tindall and Cox, 1906.

THIS elementary manual on diseases of the eye presents the fundamental principles and facts of ophthalmology in a most attractive and interesting form; it contains an excellent series of illustrations, well arranged, which add greatly to its lucidity and instructiveness.

There are many attractive elements, and much that we can heartily recommend to beginners in this concise and well-arranged book, yet we cannot say we are always satisfied with the information given, nor are we always in agreement with some of the statements made. Perhaps the excellence of the illustrations is not always sufficiently well supported by that of the text, or are we led to expect too much from the general standard of the book. We are in any case occasionally disappointed. For example, a good picture of the Morax-Axenfeld diplo-bacillus is presented, yet the description of the clinical character and type of conjunctivitis produced by this microbe is not only totally inadequate but is actually incorrect, being placed under acute catarrhal conjunctivitis. This is obviously not a slip, for there is no mention of this organism under chronic catarrhal conjunctivitis. The well-known and clinically useful fact that the salts of zinc have a special and

peculiar value in the treatment of diplo-bacillary conjunctivitis is not indicated.

In the chapter on diseases of the optic nerve, where the method of testing for the scotoma of toxic amblyopia from tobacco is described, we notice that the tip of the surgeon's nose is recommended as the fixation point. Perhaps the use of such an absurdly unsuitable fixation point may account for the fact that the figure on page 244 is incorrect, and does not show the colour scotoma of tobacco amblyopia in the position in which it really occurs.

The beginner will find this work satisfactory on the whole, many of the chapters giving an excellent account of the subject-matter with which they deal, and the entire work forming a pleasant introduction to the study of ophthalmology.

LAGRANGE and VALUDE. *Encyclopédie Française d'Ophtalmologie*. Vol. vi. Paris: Octave Doin, 1906.

THE sixth volume of this splendid work fully maintains the promise of the portions previously issued. The authors in the present section are Venneman, Lagrange, Rohmer, Dufour, and Gonin, who deal with affection of the uveal tract, the vitreous humour, and the retina. When those whose names are mentioned above are the writers there is no need to praise the work done, and when all parts are so excellent it would be invidious to compare one with another. The encyclopædic character of the book is indicated by the fact that this volume contains more than eleven hundred pages; it is enriched by the presence of a few admirably executed coloured representations of lesions of the retina, which are much superior to some of those crudely tinted diagrams with which one is only too familiar in books. In a word, there can be nothing but praise for the sixth, as there has been for the preceding five volumes of this exhaustive work, a monument of French skill, erudition, and research.

MARTINDALE and WESTCOTT. *The Extra Pharmacopœia*. London: H. K. Lewis, 1906.

THIS indispensable little book has now reached its twelfth edition; the latest containing 250 more pages than the previous issue. A great deal of work has been necessitated by the official recognition in the United States of the eighth decennial

revision of their Pharmacopœia, certain of whose more important contents have required the insertion in the familiar Martindale and Westcott of a brief outline. The processes necessary for standardising some drugs are also described in the new edition. The publication of new Pharmacopœias in Spain, Austria and Holland has required notice as well, to say nothing of the copious medical literature of our own country. The development of organotherapy, for example, the use of the milk and blood of animals where thyroid glands have been removed, and of the antitoxin treatment of leprosy, tetanus, gonorrhœa and what not, not to mention the exceeding zeal of Continental firms of manufacturing chemists, have also made demands upon the space in the volume.

The Extra Pharmacopœia is almost as necessary as an ink-bottle in every consulting room.

G. E. DE SCHWEINITZ (Philadelphia). **Signs in the Retina of High Arterial Tension.** *Ophthalmic Record*, August, 1906.

THIS article, if it does not contain much which is very new, is at least useful in drawing attention to the signs in the eye of the existence of a general systemic pathological condition whose importance it would be difficult to exaggerate. The author distinguishes clearly between what he calls suggestive signs and pathognomonic signs. Under the former heading he places uneven calibre and undue tortuosity of the retinal arteries, increased distinctness of the central light streak, an unusually light colour of the surface of the artery in its whole breadth, and alterations in the course and calibre of the veins. The pathognomonic signs include changes in the size and breadth of the retinal arteries, such that they appear beaded, distinct loss of translucency, white stripes along the vessel walls indicative of perivasculitis, alternate contractions and dilatations of the veins, and, most important of all, indentations of the veins by the stiffened arteries where one passes over the other, much as a rubber tube would be indented by a solid rod which lay across it. Besides these there may be present perivasculitis of the veins, and tortuosity of their course, œdema round the disc and large vessels, and hæmorrhages.

The most important part of de Schweinitz's paper is that which deals with the earlier signs, of which he discusses three in particular—(a) a decided corkscrew appearance of certain

of the arterial twigs. This is sometimes in a curious way localised to certain vessels, especially to those in the neighbourhood of the macula, an important point being that a small artery may be greatly altered and tortuous, even when the larger trunk from which it springs is to all appearance perfectly normal. (b) Flattening of a vein where it crosses, or is crossed by, an artery; the artery, being more rigid than it normally is, slightly compresses the softer vein. This is of course only a milder degree of what is much more marked at a later stage when the disease is more completely developed. (c) A congested nerve-head. This form of congestion differs in aspect from that seen in hypermetropes so frequently, nor does it exactly resemble the "flannel-red" of the disc which the author finds to be often present in cases of eye-strain; it differs also from the "juicy" red disc of early neuritis.

It is of the greatest importance that one should recognise the pulse and condition of such vessel walls as can be felt with the finger which go along with these alterations in the fundus, and in particular (according to Norris), that one should endeavour to gauge the mean pressure by observing not merely the systolic but the diastolic tension also. He gives the maximal readings consistent with health for the two as 160 and 130 m.m. of mercury.

Gunn has pointed out that in some cases of retro-bulbar neuritis there is irregularity in the calibre of the retinal artery, and suggested that possibly a similar condition in the arteriole supplying the macular fibres may have led to the clinical manifestation. de Schweinitz considers that this condition of the vessel walls may be a cause, too, of the persistent asthenopia which one sometimes sees after 40 years of age, particularly in women.

Further, de Schweinitz puts forward his opinion that if we were more careful to observe such fine changes in the retinal vessels we might now and then be able to save a patient from such a catastrophe as retinal or cerebral hæmorrhage, by putting him on his guard, causing him to lead a simpler life and to undergo suitable treatment. This is all the more important that while these *preliminary indications* are present the patient is, or fancies himself to be, in perfect health, and has no idea that there is a lion in the path.

It is right to add that the author does ample justice in his interesting paper to the splendid work done in this connection by Marcus Gunn.

W. G. S.

CLINICAL NOTES.

GLAUCOMA TREATED WITH HIGH FREQUENCY CURRENT.—The knowledge of the reducing effect of the high frequency currents upon arterial tension suggested to Truc (Montpellier) to try their effect also upon glaucoma. He gives the record of a case in which the efficacy of the current seemed quite decided. It was that of a man of 70, of good health, but with a considerable amount of arterio-sclerosis. In spite of iridectomy his symptoms of glaucoma remained and vision got worse and worse, the tension also remaining too high. The high frequency current was then used with most beneficial results both to the general arterial tension and to the condition of the eye. The symptoms of glaucoma gradually passed off, and vision was to a considerable degree restored. It will be interesting to learn whether other observers can confirm Truc's experience.—*Revue Générale d'Ophthalmologie*, August 31.

DIRECT PHOTOGRAPHY OF THE FUNDUS.—Hugo Wolff (Berlin), who has painstakingly and skilfully worked out a method of photography of the living fundus, shows in the *Ophthalmologische Klinik* a photograph of the fundus of his own eye. The picture is not so clear as one obtained with the ophthalmoscope, though we quite believe his statement that the original is much better defined than the reproduction. The detail is wonderful for all that, and, as he himself says, the depth of focus is very striking; thus the vessels at the bottom of a very well-marked physiological cup are very little less precise in outline than those at the margin. The details of the instrument, etc., are too complex to be reproduced here.—*Die Ophthalmologische Klinik*, x., 15, 18.

THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

Thursday, October 18th, at 8-30 p.m.

President, Mr. PRIESTLEY SMITH, in the chair.

CARD SPECIMENS.

Thrombosis of Retinal Vessels in both eyes in a boy aged 12.—

Mr. A. W. Ormond.

A boy, aged 12, came to Guy's Hospital in March 1906, having noticed some dimness in vision one month previously. On examination under atropine some slight hypermetropia was found, and the fundus showed a

yellowish mass on the superior nasal vein near the disc, and extensive recent hæmorrhages in all parts of the periphery, most marked up and out, where several vessels had united into one large trunk, which became lost in a mass of exudation and hæmorrhage. The peripheral veins were distended, while those on the proximal side of the exudation were represented by mere threads; but the vessels near the disc were of normal size. The arteries were normal. These changes were noticed in both eyes.

After admission the boy had a sharp attack of tonsillitis, with rise of temperature to 103.6° . Medical examination revealed nothing abnormal, and the investigation of the blood was negative.

At the present time the right vitreous is hazy, and the fundus shows new-formed vessels. White patches of exudation are gone, but the thrombosed vessels are still tortuous. In the left eye there are some patches of retino-choroiditis, and the margin of the optic disc is hazy.

The case was considered to be one of septic thrombosis.

PAPERS.

Metastatic Infection of the Eye.—Mr. W. T. Holmes Spicer.

This paper dealt with four cases of metastatic infection of the eye of different degrees of severity, in three of which the primary cause was situated in the skin, and the fourth was secondary to a severe attack of diarrhœa. The first case was that of a student at Cambridge, seen on January 31st, 1906, with the history that 3 days previously there had been severe pain in the left eye, followed the next morning by pain in the brow and dimness of sight, localized to a limited area in the centre of the visual field. The previous term he had suffered from raw places on the buttocks, as a result of rowing, which, however, became quite healed during the vacation. On resuming rowing several more boils appeared on the thighs and buttocks, which were so severe that they made him feel ill in himself.

$$R. V. \frac{1}{60} c \frac{-2 \text{ sph}}{-1 \text{ cyl axis horizontal}} = \frac{1}{5}.$$

L.V. Finger counting excentrically.

In the left eye was a well-defined central scotoma, extending 10° to the nasal side of the fixation point and 15° to the temporal; very slight pinkness of the whole eye, while the pupils and tension were normal. Ophthalmoscopic examination showed some vitreous opacity, and springing from the nasal edge of the optic disc was a round, brilliant, shiny white mass of a greenish tinge, globular in shape, and occupying the full width of the disc. It was elevated, though to what extent it was difficult to determine; it had a sharply defined, clear edge, as if enclosed by a

membrane. The optic disc appeared to have a myopic crescent below and to the outer side. The vessels, where they were visible, looked normal. His general condition revealed nothing of importance, and there was no specific history. The patient, under a course of iodine and mercury, showed no improvement, and on February 2nd the swelling had extended further forwards, and several nodules were seen; what had appeared to be the myopic crescent was found extending several discs diameter beyond the yellow spot, and was pink in colour. Three days later the tumour had come still further forward; and as there was a good deal of constitutional disturbance, the eye was excised. On the assumption that the tumour was of a parasitic nature, a knife was passed into the sclerotic, previous to excision, and an attempt made to break up the contents of the supposed cyst, but without success. Some difficulty was experienced in removing the eyeball, owing to a mass of orbital tissue being adherent to the globe behind. The pathological examination, conducted by Mr. Coats, showed the whole of the posterior part of the fundus covered by a thick yellowish mass measuring 10.5 m.m. horizontally, about the same vertically, and 3 m.m. in height, stretching out more on the temporal than the nasal side. It was found to be a metastatic abscess containing innumerable Gram-positive organisms which were probably staphylococci, one clump being so thick that it could be seen with the naked eye; the tumour occupied the optic papilla in front of the lamina cribrosa, a short distance internal to the choroid on the temporal side. It was probably embolic in character, but owing to the abscess being situated near the point of anastomosis of the retinal and ciliary systems, it was difficult to determine the actual vessel involved. All the surrounding tissues were infiltrated to a slight extent. The central vessels were flattened but not thrombosed.

The second case was one of phlebitis of the retina due to metastatic infection from a skin abscess; and occurred in a man, aged 22, who three years before (in Feb. 1900) had complained of dimness of sight in the left eye, following upon a severe boil in the neck. He was "subject to colds," one of which had just confined him to bed for several days. An examination by a doctor showed some optic neuritis and hæmorrhage.

On February 20th, 1900, he was seen by Mr. Nettleship, when the vision of the left eye was $\frac{6}{18}$, but four days later it was counting fingers only. R. V. $\frac{6}{6}$. A note made on February 26th gives: severe hæmorrhagic retinitis, much distension of the veins, œdema and a profusion of hæmorrhages, which changes are most noticeable in the upper part, though no portion of the fundus is free. Right eye shows similar changes, commencing in lower temporal veins, beginning at 2—3 optic disc diameters from the optic disc, and extending to the extreme peripheral radicles, with similar changes in the upper temporal vein; the changes referred to were: (a) white cotton-like deposit on the coats of the vessels, (b) some

hæmorrhages, (c) a black spot amongst the upper temporal radicals. The disease was diagnosed as phlebitis of the terminal radicles, gradually spreading in the direction of the blood current and leading to thrombosis.

After some months' treatment at Wiesbaden, the patient returned with no perception of light in the left eye.

In December 1903, the eye became irritable, and showed signs of iridocyclitis, and the patient felt ill in himself; so that on December 14th the eye was removed with immediate and marked improvement in the general condition.

The pathological examination, conducted by Mr. Coats, showed a layer of dense vascular tissue on the anterior surface of the iris with blocked angle. The ciliary body was atrophic; the retina was degenerated, and on the vitreous surface there was a large quantity of delicate vascular connective tissue, evidently of old standing, which by its contraction had pulled the retina into folds. Some polymorphonuclear leucocytes in part of the retina indicated recent inflammatory reaction; and while most of the retinal vessels were partly or wholly obliterated, others were fairly normal. There was no evidence of thrombosis of the central vein.

This appeared to be a case where the organism, after doing a certain amount of damage, had remained quiescent for some time, and then, from some unknown cause, became stimulated later to renewed activity.

The third case was one of acute retinal phlebitis and local keratitis profunda, following an acute attack of diarrhœa.

Walter H., aged 18, came to Moorfields on October 30th, 1901, with the history that his eyes had been bloodshot for two months, and the left eye became bad first. Shortly before he had a severe attack of diarrhœa, which lasted 3 weeks. General health fairly good; rheumatic fever when 7 years old.

R. V. $\frac{6}{6}$ and Ji.

L. V. $\frac{6}{6}$ and Ji.

By the ophthalmoscope it was seen that in the right eye two large branches of the upper and lower temporal veins were thrombosed, and streaked with white for a long distance; there were some hæmorrhages and much vitreous exudation. In the left was some vitreous exudation, as well as widespread flattened hæmorrhages, chiefly at the inner and outer part of the periphery; many white fleecy areas of inflammatory exudation round the veins, which were full in both eyes.

On November 27th a congested patch appeared at the upper and outer part of the limbus, and this subsequently developed into interstitial keratitis, extending one-third of the distance across the cornea. On December 17th the signs of thrombosis in both eyes had gone, and the vessels had become normal. The patient remained well until November 1903, when he again complained of a thick mist coming on suddenly over right eye,

and a large floating mass was seen in the vitreous, but no details of the fundus were obtained.

In February 1904, there was still some blood in the vitreous, and behind the corneal opacity there was a great mass extending deeper into the interior of the eyeball; there is also some white fibrous matter in front of a retinal artery at the lower part, of the nature of retinitis proliferans.

Mr. Spicer considered this to be a case of phlebitis of the retinal veins, which had cleared, but as a result of this condition some cicatricial bands had formed anteriorly, which had caused some interference with the local blood supply of the cornea, thus inducing keratitis profunda.

The fourth case was one of diffuse exudation between the retina and the choroid—producing local detachment of the retina—which was due to infection from boils on the neck.

A man, aged 24, came to Moorfields in March 1906, with failure of sight in the right eye for eight weeks, slowly getting worse. Patient was in good health with the exception of a crop of boils all round his neck, to which he has been subject as long as he can remember. There was no syphilitic history.

R. V. $\frac{3}{60}$, L. V. $\frac{6}{9}$ c + 1.75 = $\frac{6}{5}$.

The note on April 7th says that there are some small and large vitreous opacities; the optic disc has an indistinct edge, and there is a band of exudation extending on the nasal side up and in as far as the extreme periphery, but on the temporal side only half way to the periphery. The lower two-thirds of the fundus shows a large belt of white exudation, quite distinct from the other band, beneath the retina, and raising it up as high as 3 m.m. The retinal veins are much distended, but there are no hæmorrhages and no thrombosis. The opsonic index was found to be 0.9, and staphylococcic injection was advised, but the patient would not stay in to undergo the treatment. Subsequent examination has shown the exudation slowly but steadily increasing, and the actual deposit appears to be beneath the retina, probably in connection with the choroidal circulation.

Most of the cases previously described of metastatic retinitis appear to have been of a purulent nature, running on to panophthalmitis. The possibility, indicated by the present series of cases, of infection with different kinds of organisms from a remote source may serve to explain the hitherto uncertain nature of many cases of recurrent exudative choroiditis in which the more acute inflammatory changes subside, leaving some atrophied spots as a result.

The suggestion that toxins may be carried from some distant inflammatory focus to the tissues of the eye, causing some secondary changes, was also put forward.

Posterior Scleritis and Infarction of the Posterior Ciliary Arteries.—

Mr. George Coats.

Cases of deep-seated scleritis are generally of the nature of "brawny infiltration of the sclera or annular scleritis," but posterior scleritis has not often been described.

A case is recorded by Fuchs of a lad aged 16, who had suffered from diphtheria six weeks before, and when he came under observation, complained of pain in the outer canthus of the left eye, and in the side of the head; some days later his sight became dim with slight conjunctival congestion at the other side, and a few enlarged vessels. There was some pain on pressure of the globe; the optic disc was red and blurred, and the macula region was bulged forward to the extent of 3—4 dioptries. Vision with $+5 = \frac{6}{12}$ pt. In a few days the pain subsided, and in a little more than a fortnight hypermetropia and opacity of retina had disappeared. Two months later the right eye was attacked in exactly the same way, and again in a short time the symptoms subsided. The evanescent character of the symptoms, which passed off leaving no trace behind, combined with the physical signs, clearly pointed to an affection of the sclera posteriorly. Fuchs refers to a similar case recorded by Knapp in 1868, with much the same symptoms coming on with cardiac attacks. Another case reported by Wagenmann is of the same nature, but much more severe, with swelling of lids and conjunctiva, and some proptosis. There was in this case a detachment of the retina up and in overhanging the disc, and there was in addition evidence of cyclitis. All the symptoms gradually subsided.

Pathological proof was furnished in a case of Wagenmann's, but the eye was previously diseased, so that the clinical features were masked. The patient was a man who had had a detachment in the left eye 23 years ago, and subsequently developed glaucoma with pain, œdema, and exophthalmos. During the excision of the eye, a swelling was found, occupying the external inferior quadrant from behind the external rectus to the nerve entrance. It proved to be plastic scleritis, with much thickening and cellular infiltration. In a case reported by Gayet, where the whole of the sclera in both eyes was affected, the cornea eventually becoming involved, the changes were chiefly in the posterior part.

A similar case is also described by Coppez.

The case now described by Mr. Coats came under the care of Mr. Lang at Moorfields, on January 8th, 1906, owing to failure of sight in the left eye. Dimness of sight began 12 months before as a slight mist, which in a week or two became so dense that even large objects became invisible. There was no pain or photophobia, no exophthalmos or pain on pressure

of the globe, but the eye showed all the signs of chronic cyclitis; there was no P.L., and the tension was increased.

Pathological examination showed an equatorial staphyloma above, and one commencing on the nasal side. Retina and vitreous *in situ*.

There is a peculiar diseased patch in the fundus above the disc. It commences 4.5 m.m. above the disc, and is about 10 m.m. in diameter. It has the appearance of a brown island, somewhat paler than the fundus elsewhere, surrounded by a moat or gutter of a mottled yellow appearance. The island is bounded towards the moat by a sharply defined darker line: the outer circumference of the moat is equally well defined, except that between the papilla and the left hand lower corner there is an area of slightly discoloured atrophic choroid. Everywhere else the choroid has its normal brown colour, except for a few small atrophic patches about the ora serrata. There is no evident thickening of the choroid or sclera, and neither the choroid nor the retina is detached.

The most interesting part of the microscopical examination centres round the changes produced in the island-like area above the papilla. They consist of extensive areas of necrosis of the sclera, choroid and retina, with some inflammatory reaction around it. The necrotic patch is confined to the inner lamellar of the sclera and occupies rather more than a third of its thickness; there is no nuclear staining, but outside this area there is considerable infiltration. The same condition is shown in the corresponding parts of the choroid and retina, but the area affected is slightly larger. The changes are of a different character from those of any form of choroido-retinitis. The limitans interna and externa are for the most part complete, but between them there is nothing but granular detritus; the pigment is scattered about in clumps, and between the retina and the papilla there is much cellular infiltration, but no retinal structure is visible. The other changes are those of chronic iridocyclitis with secondary glaucoma.

Mr. Coats considers that this necrotic area is of the nature of an infarction, similar to those found in the kidney, spleen, and lung, produced by toxic bodies of low virulence giving rise to blocking of one of the posterior ciliary arteries, which at this point do not anastomose to any great extent, and in support of this theory precisely similar changes have been produced in rabbits experimentally (Wagenmann) after division of posterior ciliary arteries. Similar changes have been seen in human eyes where optico-ciliary neurotomy has been performed (Collins).

Observations on Hue-perception.—Dr. Edridge-Green.

These observations were made with an instrument by means of which the exact size of a portion of the spectrum, which appeared monochromatic, was ascertained, when it was isolated from the adjacent portions.

A long table of cases accompanied the paper, and as a result of much laborious work, it was found that hue-perception was most accurate in the blue and yellow regions, though in the greater number the accuracy was most marked in the yellow. There was a gradual diminution towards the centre and ends of the spectrum; green came next, then violet, and lastly red.

These facts were in accordance with the author's theory of colour perception, as predicted by him; namely, that the colour perception of different individuals varies with the development of a colour perceiving centre in the brain; and that those with a greater development of this centre see more colours (points of difference) than those with a less development, and that colours appear in a regular order at the successive points of difference in a straight series. MALCOLM L. HEPBURN.

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